Mini System PHIL -05328 **FW768P/21/21M/34**

Service
Service
Service

Service Manual

ReWritable CD COMPATIBLE

COMPACT disc DIGITAL AUDIO

Introduction of FW768P/21/21M/34

For Service documentation please refer to Service Manual FW768P/22/37 - 4822 725 26281.

FW768P/21/21M refers to FW768P/22 with the following adaptations:

1. Mechanical & Accessories

Change:	108	4822 454 13035	Badge Philips
	139	4822 450 10628	Window Display
	143	4822 442 01761	Cover RDS/NEWS
	387	4822 736 16752	Instruction For Use
	5280	4822 146 10755	Mains Transformer

2. Front Board

Change:	7400	4822 209 17405	TMP87CS71F - '768S51861'

Delete: 1408 , 2408 , 2409 , 2410 , 2411 , 2446 , 2447 , 3487 , 3488 , 3489 , 3491 , 5402 , 7403

3. Module Power4-99

Add:	1200	4822 071 51002	Fuse T1A
	1201	4822 071 51002	Fuse T1A
	1210	4822 272 10269	Voltage Selector
Delete:	1202		

4. Tuner Board : Refer to ECO5 Sys /01 version 2-Band, FM/MW.

FW768P/34 refers to FW768P/22 with the following adaptations:

1. Mechanical & Accessories

Change:	108	4822 454 13035	Badge Philips
	387	4822 736 16753	Instruction For Use

2. Tuner Board : Refer to ECO5 Sys /14RDS version 2-Band, FM/MW(RDS).

CLASS 1
LASER PRODUCT

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GB 3139 115 50030

PCS 102 703

PHILIPS

PHIL-05315

Mini System

FW768P/22/37

Service
Service
Service

For repair information on the Active Subwoofer, see Service Manual "Active Subwoofer SW030/37".

Service Manual

ReWritable CD COMPATIBLE

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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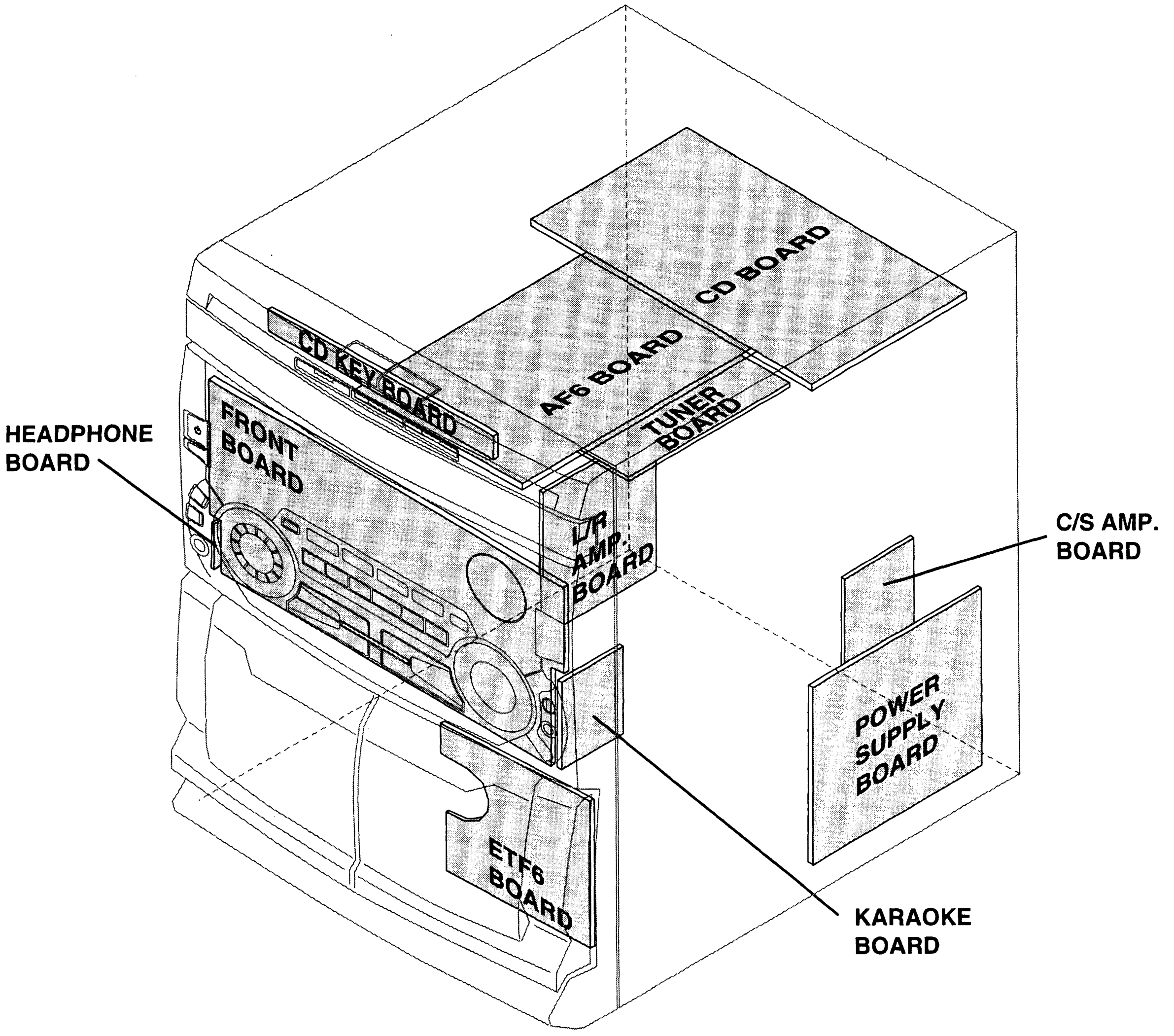
GB 4822 725 26281

PCS 101 091

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS


CD BOARD
AF6 BOARD
TUNER BOARD
CD KEY BOARD
FRONT BOARD
HEADPHONE BOARD
L/R AMP. BOARD
C/S AMP. BOARD
POWER SUPPLY BOARD
ETF6 BOARD
KARAOKE BOARD

VERSION VARIATIONS:

Type /Versions:	FW768P							
Features & Board in used:	/22	/37						
Aux In	x	x						
Line Out	x	x						
Surround Out	x	x						
Subwoofer Out	x	x						
Digital Out	x							
Matrix Surround								
Dolby B								
RDS	x							
News	x							
Incredible Surround	x							
Karaoke Features	x							
Voltage Selector								
Low Power Standby / LED								
Tuner board - ECO5 Sys		x						
Tuner board - Tuner 95	x							
Surround speakers	x	x						
Center speaker	x	x						
Active Subwoofer (SW030/37)		x						

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30
Mains frequency : 50/60Hz
Power consumption : < 13W at Standby
< 80W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 390mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/21M/37
Grid : 9kHz
10kHz for /21/21M/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power (6ohm, 1kHz, 10% THD)
L & R : 2 x 40W
Surround : 2 x 20W
Center : 20W

Frequency response within -3dB : 40Hz-16kHz
Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB OFF [1]
Incredible Surround : IS ON , IS OFF [1]
Digital Sound Control :
Optimal, Classic, Techno, Jazz, Rock, Vocal [1]

Dolby Pro Logic (DPL) : Dolby Surround
: Dolby Center Phantom
: Dolby 3 Stereo
: Normal Stereo

Headphone output at 32 ohm : 15mW ± 2dB

Input sensitivity
Aux in : 500mV ±2dB at 1 kohm
Microphone : 2.5mV ± 2dB at 600 ohm
Output sensitivity
Line out : 500mV ±2dB at 22 kohm
Subwoofer out (max. vol.) : 1.5V ± 2dB at 22 kohm
Surround out : 500mV ±2dB at 22 kohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76cm/sec -0.8/+1.8%
1.6 x 4.76 cm/sec
Wow and flutter : < 0.4% (IEC)
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio (IEC I) : > 43dB
Signal to noise ratio (IEC II) : > 47dB

COMPACT DISC:

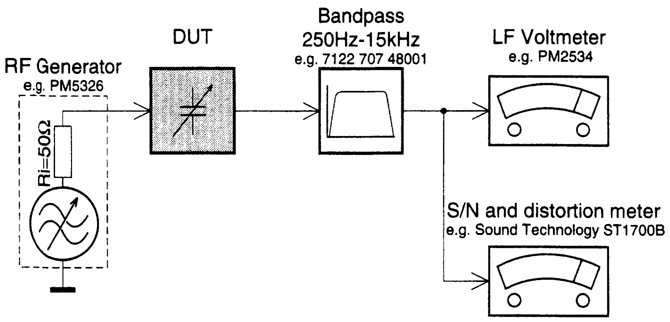
Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV± 1dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

[1] Frequency response in each setting is software controlled.

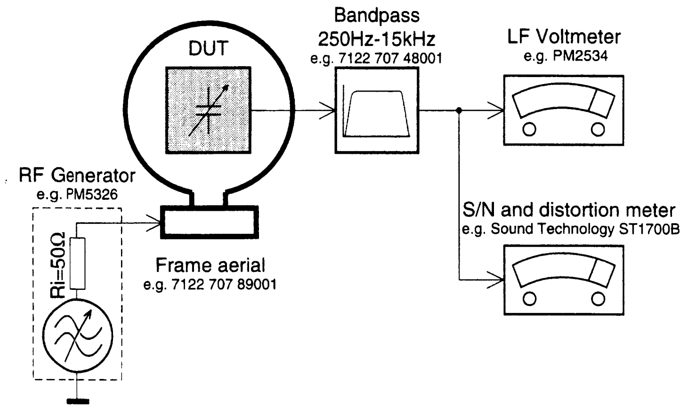
MEASUREMENT SETUP

Tuner FM


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

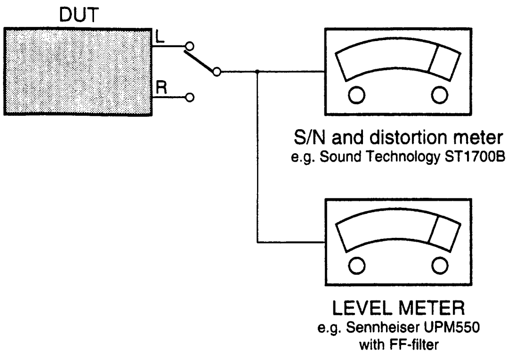
Tuner AM (MW,LW)


Bandpass
250Hz-15kHz
e.g. 7122 707 48001
DUT
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
S/N and distortion meter
e.g. Sound Technology ST1700B
Ri=50Ω
Frame aerial
e.g. 7122 707 89001

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

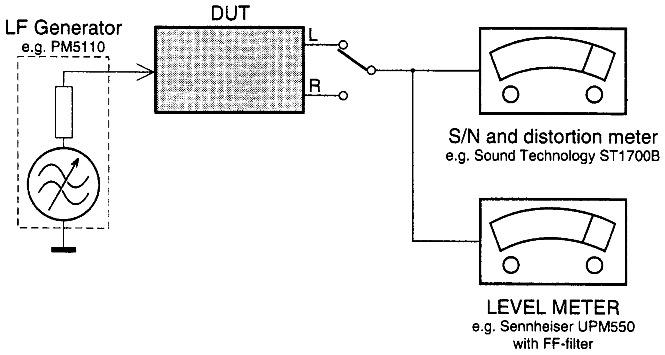
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

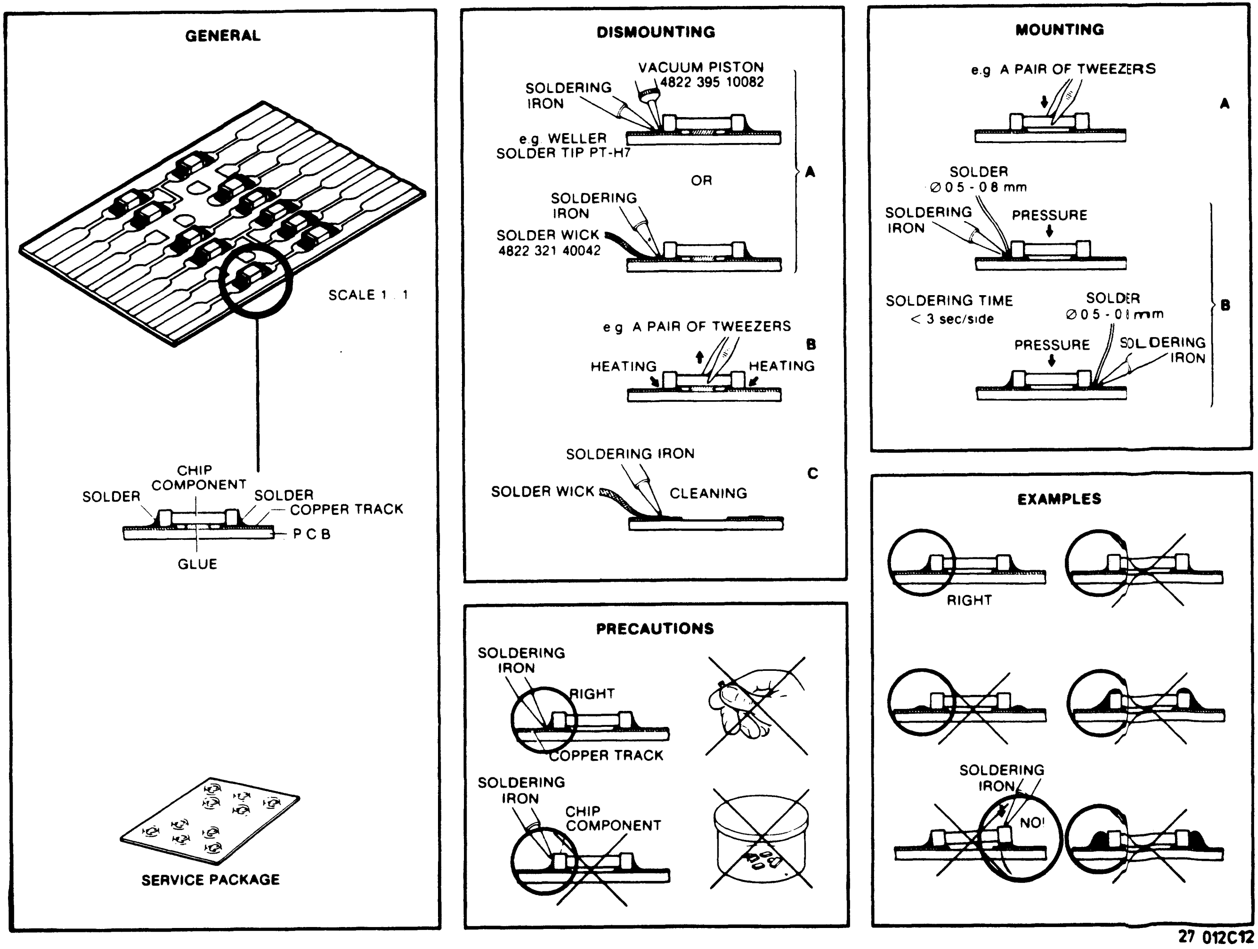
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
PCB
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON 4822 395 10082
SOLDERING IRON
e.g WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK 4822 321 40042
A
e.g A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
SOLDER WICK
CLEANING
C
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
MOUNTING
e.g A PAIR OF TWEEZERS
A
SOLDER Ø 0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME < 3 sec/side
SOLDER Ø 0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

ESD

GB WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

SF Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

GENERAL INFORMATION / SAFETY INFORMATION

General Information

- ***The typeplate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This product complies with the radio interference requirements of the European Community.***

Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Acknowledgement

DOLBY SURROUND
PRO • LOGIC

Dolby Pro-Logic and the double-D symbol ▯▯ are trademarks of Dolby Laboratories Licensing Corporation.
Manufactured under license from Dolby Laboratories Licensing Corporation.

Accessories *(Supplied)*

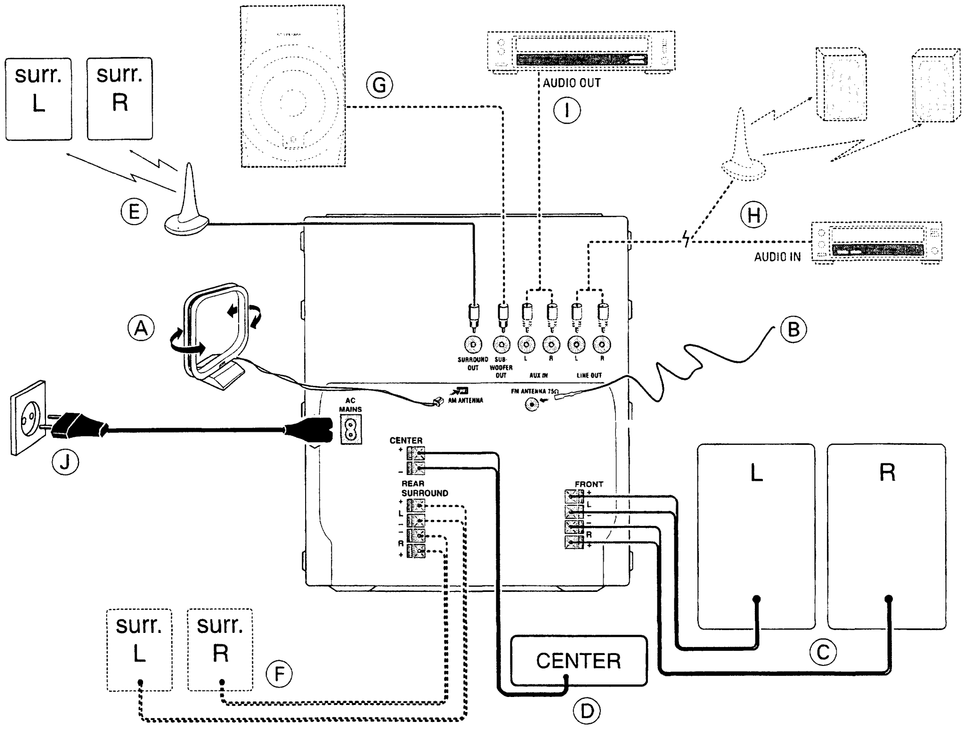
- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- For model FW768P only - FB3 speaker package (includes one pair of surround speakers and one center speaker)
- For model FW768P only - SW 030 Active Subwoofer
- For model FW798W only - FB219W speaker package (includes one pair of wireless surround speakers and one center speaker)

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in the system.
- The system incorporates a built-in safety feature that prevents overheating.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATION

Rear Connections



Ⓐ AM Loop Antenna Connection

Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

Ⓑ FM Wire Antenna Connection

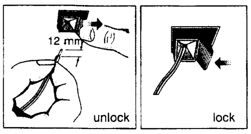
Connect the supplied FM wire antenna to the FM ANTENNA 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM ANTENNA 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speakers Connection

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to – .
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to – .
- Clip the stripped portion of the speaker wire as shown.


12 mm
unlock
lock

Ⓓ Wireless Surround Out Connection

You many connect transmitter unit of the wireless rear speakers (supplied with model FW798W only) to the SURROUND OUT terminal. *See section on 'Setting up FB219W'.*

Note:

- *Availability of wireless transmitter and its peripherals are subjected to the approval of local authorities. Please check with respective local safety or approving authority.*

Ⓔ Center Speaker Connection

Connect the black (non-marked) wires to the black CENTER terminal and the blue (marked wires) to the blue CENTER terminal.

Ⓕ Rear Speakers' Connection

Connect the black (non-marked) wires to the black REAR SURROUND terminals and the white (marked wires) to the grey REAR SURROUND terminals.

Ⓖ Subwoofer Out Connection

Connect the active subwoofer (supplied with model FW768P only) to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

Ⓗ Line Out Connection *(wireless ready)*

You can connect the audio left and right LINE OUT terminals to a optional CD Recorder ANALOGUE IN terminals. This allows you to record in an analogue format.

You can also install additional optional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Ⓘ Connecting other equipment to your system

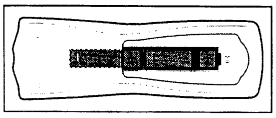
You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD-Recorder to the AUX IN terminals at the rear of the system.

Ⓙ AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

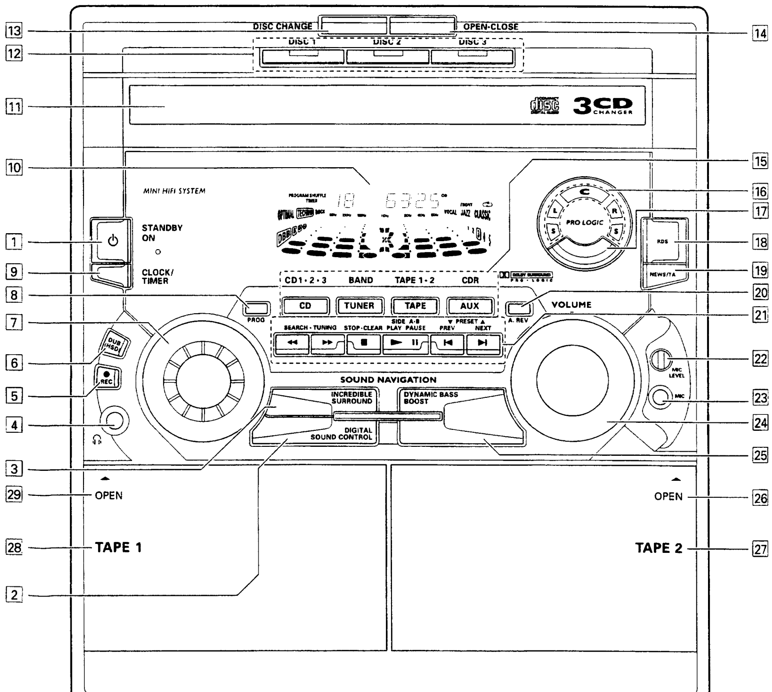
Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

CONTROLS


DISC CHANGE
OPEN·CLOSE
DISC 1
DISC 2
DISC 3
3CD CHANGER
MINI HIFI SYSTEM
STANDBY ON
CLOCK/ TIMER
CD1·2·3
BAND
TAPE 1·2
CDR
CD
TUNER
TAPE
AUX
PROG
A. REV
VOLUME
SEARCH · TUNING
STOP·CLEAR
SIDE A·B PLAY PAUSE
▼ PRESET ▲ PREV NEXT
PRO LOGIC
RDS
NEWS/TA
DUB (HSD)
REC
SOUND NAVIGATION
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
DIGITAL SOUND CONTROL
MIC LEVEL
MIC
OPEN
TAPE 1
OPEN
TAPE 2
1
2
3
4
5
6
7
8
9
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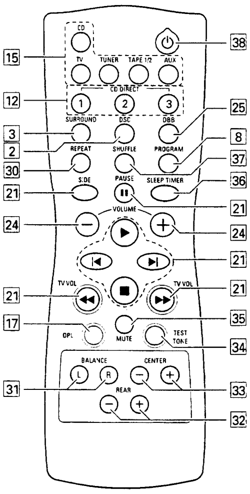

CD
TV
TUNER
TAPE 1/2
AUX
CD DIRECT
1
2
3
SURROUND
DSC
DBB
REPEAT
SHUFFLE
PROGRAM
SIDE
PAUSE
SLEEP TIMER
VOLUME
TV VOL
TV VOL
DPL
MUTE
TEST TONE
BALANCE
L
R
CENTER
REAR
15
12
3
2
30
21
24
21
17
31
38
25
8
37
36
21
24
21
21
35
34
33
32

Controls on the system and remote control

1 **STANDBY ON**
- to switch the system on or to standby mode.
- to use for EASY SET.

2 **DIGITAL SOUND CONTROL (DSC)**
- to select the desired sound effect : OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.

3 **INCREDIBLE SURROUND**
- to switch on or off the surround sound effect.

4 **∩**
- to connect headphones.

5 **REC (RECORD)**
- to start recording on tape deck 2.

6 **DUB (HIGH SPEED DUBBING [HSD])**
- to dub a tape in normal or fast speed.

7 **JOG**
- to select the desired equalizer display.
- to select the desired DSC setting. You must select the DSC feature first.
- to select the desired level of Incredible Surround Sound. You must select the Incredible Surround Sound feature first.

8 **PROG (PROGRAM)**
- to program CD tracks in CD mode or preset radio stations in tuner mode.

9 **CLOCK/TIMER**
- to view the clock, set the clock or set the timer.

10 **DISPLAY**
- to view the current setting of the system.

11 **CD CAROUSEL TRAY**

12 **CD DIRECT PLAY (DISC 1 / DISC 2 / DISC 3)**
- to select a CD tray for playback.

13 **DISC CHANGE**
- to change CD(s).

14 **OPEN•CLOSE**
- to open or close the CD carousel.

15 **SOURCE** : to select the following:

CD / (CD 1•2•3)
- to select CD mode. When CD playback is stopped, press to select the disc tray 1, 2 or 3.

TUNER / (BAND)
- to select Tuner mode. When in Tuner mode, press to select the waveband: FM, MW or LW.

TAPE / (TAPE 1• 2)
- to select Tape mode. When tape playback is stopped, press to select either tape deck 1 or 2.

AUX / (CDR)
- to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder). When in Aux mode, press to select either AUX or CDR.

TV *(only on the remote control)*
- to select TV mode.

16 **DPL DISPLAY PANEL**
- to view the selected Dolby Pro Logic setting.

17 **DOLBY PRO LOGIC (DPL)**
- to select Dolby Surround, Dolby Center Phantom, Dolby 3 Stereo or Stereo mode.

18 **RDS**
- to select RDS data in the following order: station name, program type, radio text and frequency.

19 **NEWS/TA**
- to hear News or Traffic Announcement data automatically.

20 **A. REV (AUTO REVERSE)**
- available in tape deck 2 only.
- to select the desired play modes (⌶ / ⊐ / ⊏⊐).

21 **MODE SELECTION**

SEARCH ◀◀ ▶▶ (TUNING ◀◀ ▶▶)

for CD .... to search backward/forward.

for TUNER ..... to tune to a lower or higher radio frequency.

for TAPE .... to rewind or fast forward a tape on tape deck 2 only.

for TV VOL. .... to adjust the TV volume if the remote operates your TV.

STOP•CLEAR ■

for CD .... to stop CD playback or to clear a program.

for TUNER ..... to stop programming.

for TAPE .... to stop playback or recording.

DEMO .... *(on the system only)* to start or stop demonstration mode.

PLAY ▶ / PAUSE ❚❚ (SIDE A•B)

for CD .... to start or interrupt playback.

for TAPE .... to start playback.

.... SIDE : When playing in Tape 2 mode, to change side.

PREV ⏮ / NEXT ⏭ (PRESET ▼ ▲)

for CD .... to skip to the beginning of the current, previous, or next track.

for TUNER ..... to select a preset radio station in memory.

22 **MIC LEVEL**
- to adjust the mixing level for karaoke or microphone recording.

23 **MIC**
- to connect microphone jack.

24 **VOLUME**
- to adjust the volume.

25 **DYNAMIC BASS BOOST (DBB)**
- to select a bass boost level or to switch off bass boost.

26 **OPEN**
- to open tape deck 2.

27 **TAPE DECK 2**

28 **TAPE DECK 1**

29 **OPEN**
- to open tape deck 1.

30 **REPEAT**
- to repeat a CD track.

31 **BALANCE L/R**
- to balance the sound level of the Front Left and Right speakers.

CONTROLS

32 **REAR +/−**
- to adjust the sound level of the surround speakers.

33 **CENTER +/−**
- to adjust the sound level of the center speaker.

34 **TEST TONE**
- to check the sound level of the Front Left, Front Right, Center and Surround speakers.

35 **MUTE**
- to switch off the sound temporarily.

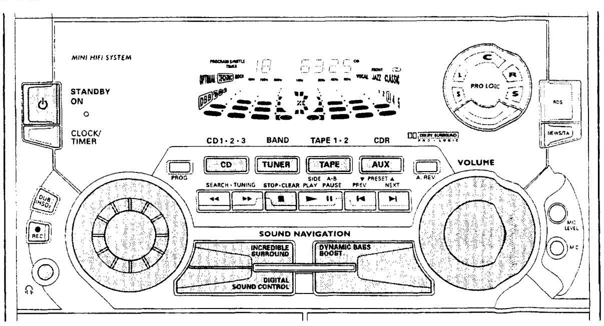
36 **SLEEP TIMER**
- to switch the system to standby mode at a selected time.

37 **SHUFFLE**
- to play all the available discs and their tracks in random order.

38 **⏻**
- to switch the system to standby mode.

Notes for remote control:
- ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).***
- ***Then select the desired function (PLAY, NEXT, etc.).***

OPERATING THE SYSTEM



Important:
Before you operate the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***When the system is switched on for the first time, the demonstration mode will start automatically.***

Notes:
- *During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).*
- *When the system is switched to standby mode, the demonstration will resume 5 seconds later.*

To stop the demonstration mode
- Press and hold **STOP•CLEAR ■** *(on the system only)* for ***5 seconds*** when the system is in demonstration mode.
  → The demonstration will stop.
  → "DEMO OFF" is displayed.
  → The system will switch to standby mode.

Note:
- *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

To start the demonstration mode
- Press and hold **STOP•CLEAR ■** *(on the system only)* for ***5 seconds*** when the system is in standby mode.
  → The demonstration will begin.

Easy Set

EASY SET allows you to store all available radio stations and RDS stations automatically.

1 Press and hold **STANDBY ON** *(on the system only)* for ***5 seconds***; when the system is in standby or demonstration mode.
  → "EASY SET" will be displayed, and followed by "TUNER" and then "AUTO".
  → EASY SET will start searching for all radio stations with RDS and then followed by radio stations on FM, MW and LW band respectively.
  → All available RDS and radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.
2 The system will search once again for the first available RDS station in order to set the RDS time automatically.
- If no RDS station is available, the program will exit automatically.
  → After a radio station is found, "EASY SET" will be displayed and followed by "TIME"
- When searching RDS time;
  → "SEARCH RDS TIME" will be displayed.
  → When RDS time is read, "RDS TIME" will be displayed. The current time will be displayed for 2 seconds and stored automatically.

Notes:
- *EASY SET will start with the RDS station, if there are still presets available, it will continue to store the FM, MW and LW bands respectively.*
- *When EASY SET is used, all previously stored radio stations will be replaced.*
- *The last preset radio station or the first available RDS station will appear on the display when EASY SET is completed.*
- *If RDS station does not transmit RDS time within 90 seconds, the program will exit automatically and the display will show "NO RDS TIME".*

Switching the system ON

- Press **STANDBY ON** *(on the system only)*, **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY ON** again or ⏻ on the remote control.
  → The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
  → The display indicates the selected source.

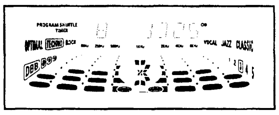
Note:
- *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX IN terminals.*

Selecting the Equalizer Display

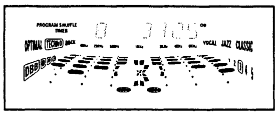
You can select the desired equalizer display for the system. You must not press the DSC button on the system before using the JOG.

- Rotate the **JOG** to select the desired Equalizer Display, NORMAL, TOP DOWN, or NITE MODE.
  → The selected display will be shown.

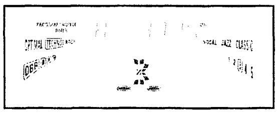
NORMAL Display



TOP DOWN Display



NITE MODE Display



Note:
- *In NITE MODE, all lights will be switched off and the display brightness will be dimmed.*

Sound Control

VOLUME ADJUSTMENT

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

DIGITAL SOUND CONTROL (DSC)

The DSC feature enables you to adjust the system to suit your type of music.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.
  → The selected digital sound is encircled.
  → "OPTIMAL X, CLASSIC, TECHNO X, JAZZ X, ROCK X or VOCAL X" will be displayed. "X" is the pre-selected level.

You can change the digital sound setting level for all but CLASSIC with the JOG.

- First select the DSC feature, then rotate the **JOG** until the desired digital sound setting level is reached.
  → The digital sound setting level will increase or decrease between level 1 and 5.

Note:
- *For neutral setting, select CLASSIC and switch off DBB.*

DYNAMIC BASS BOOST (DBB)

There are three DBB settings to enhance the bass response.

- Press **DBB** briefly to select a bass boost level.
  → The respective DBB level is being encircled and lit.
  → "BEAT", "PUNCH" or "BLAST" will be displayed.

To switch off DBB
- Press **DBB** briefly until "DBB OFF" is displayed.

Note:
- *Some CDs or tapes might be recorded in high modulation. It may cause a distortion at high volume. If this occurs, switch off DBB or reduce the volume.*

Automatic DSC-DBB selection

The best DBB setting is generated automatically for each DSC selection. You can manually select the DBB setting that best suits your listening environment.

INCREDIBLE SURROUND

Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect. There are 12 different Incredible Surround levels available for selection.

- Press **INCREDIBLE SURROUND** to switch on.
  → The INCREDIBLE SURROUND display lights up.
  → "IS XX" will be displayed.

Note:
- *"XX" is the last selected Incredible Surround level.*

You can change the Incredible Surround level with the JOG.

- Rotate the **JOG** to select the desired Incredible Surround level immediately after selecting the Incredible Surround feature.
  → The Incredible Surround level will increase or decrease between level 1 and 12.

To switch off Incredible Surround
- Press **INCREDIBLE SURROUND** again.
  → The INCREDIBLE SURROUND display is switched off.
  → "IS OFF" will be displayed.

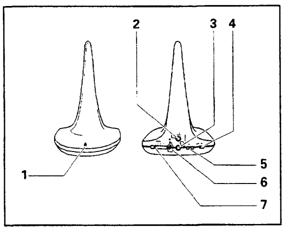
MUTE *(on remote control only)*

This feature allows you to temporarily switch off the sound without switching off the system when you require a moment of silence.

- Press **MUTE** on the remote control to switch off the sound.
  → "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.

The following equipment are supplied with the FB219W package:
- AC/DC adapter
- transmitter unit
- 2 wireless surround speakers
- 2 power cables for the surround speakers
- 1 center speaker
- 1 cinch cable

Transmitter



1 **Status light**
RED .... Transmitter is on.
BLINKING ...... Transmitter is on and input level is too high (see 5).
OFF .... Transmitter is in standby mode or is not connected to the AC/ DC adapter.

2 **L (SUB)**
Not used with the supplied configuration.

3 **R (SURR)**
To connect the transmitter unit to the SURROUND OUT (SURR PRE OUT) jack of your set.

4 **SURR / MULTI**
Set this selector to SURR, the position MULTI is not used with the supplied configuration.

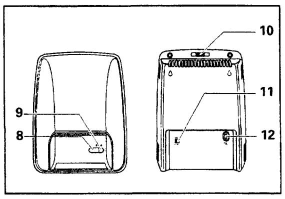
5 **A·B·C**
To set the input sensitivity of the transmitter unit.
A .... maximum sensitivity
B .... medium sensitivity
C .... minimum sensitivity

6 **14 V**
Connect the provided AC/DC adapter here.

7 **CHANNEL**
7 step channel selector for setting the channel in case of interferences.

Notes:
- *Always be sure that the transmitter unit and the active surround speaker are switched to the same channel, otherwise no sound or only a distorted sound will be heard on the surround speakers.*
- *Cellular phones used near the system (1–2 meters) may interfere with the transmission.*
- *You have to switch off the active surround speaker before setting the transmitting channel.*

Active surround speakers



8 ⏽
GREEN LIGHT: If this is on, the active speaker is on.

9 ⏻
RED LIGHT: If this is on, the active speaker is in standby mode.

Note:
- *If both lights are off the active speaker is switched off or is not connected to a power source.*

10 **CHANNEL**
7 step channel selector for setting the channel in case of interferences.

11 **POWER**
To switch the active surround speaker on and off.

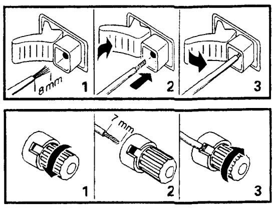
12 **MAINS**
To connect the active surround speaker to the power source.

Connections

Important!
Always switch off all your equipment before making any connections!

To connect your wireless speaker system, refer to the picture above.

The speaker connections on the appliance may be screw connectors or click-fit connectors.



At the rear of the appliance you will find a colored or ⊕ terminal and a black or ⊖ terminal for each speaker.

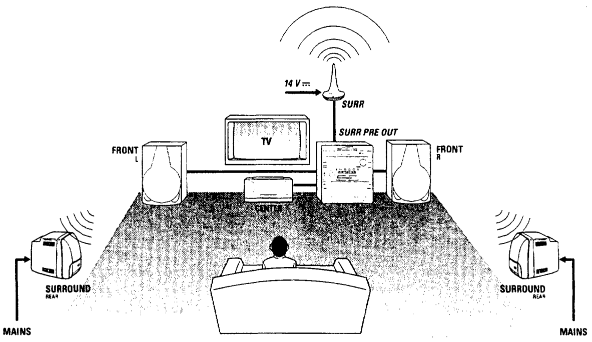
Note:
- *After connecting all the speakers, do not forget to adjust the relative sound level between them.*

Front speakers and center speaker
Connect the colored speaker wire to the coloured or ⊕ terminal, and the black wire to the black or ⊖ terminal of the appliance.

Surround speakers
Connect the active speakers to the power source with the power cable provided. Switch on the active speaker with the POWER switch.

Transmitter unit
Connect the SURR terminal of the transmitter with the PRE OUT (SURROUND) terminal of the appliance using the supplied cinch cable. Connect the AC/DC adapter supplied to the 14 V socket of the transmitter. Then connect the AC/DC adapter to the power source.

Note:
- *The SUB terminal of the transmitter is not used with this set.*



Positioning

Position the unit in a way that you are able to "see" the active surround speaker from the position of the unit.

To avoid sound distortions caused by magnetic fields do not place the transmitter on your TV set.

Positioning the speakers

Important!
To avoid overheating do not cover any vents and leave a minimum distance of 5 centimeters (2 inches) for ventilation.

General hints for positioning
Avoid positioning the speakers in a corner or on the floor, as this will boost the bass tones too much. Placing the speakers behind curtains, furniture etc. will reduce the treble response, thus reducing the stereo effect considerably. The listener should always be able to "see" the speakers.

Each room has different acoustic characteristics and the positioning possibilities are often limited. You can find the best position for your speakers by following the picture above. The speakers should always be arranged as symmetrically as possible in the room.

Positioning the center speaker
The center speaker should be placed in the center between both front speakers, e. g. underneath or on top of the TV. The best height for the center speaker is at the height of the listener's ears (while seated).

Positioning the surround speakers
The surround speakers should face each other and be in line with, or at most 1.5m (4ft 6ins) behind the listener.

Setup

Adjusting the relative sound level
After installing your speakers, you will have to find a good sound balance between the surround, center and front speakers.

In the instruction booklet of your appliance you will find a section describing how to adjust the sound of the different speakers. Follow those instructions to get the most out of your new speakers.

Setting the input sensitivity A·B·C
Depending on which soundsource you use, the signals delivered have different strengths.

If the red light on the front of the transmitter unit **starts to blink**, the incoming signal is too strong. This will cause distortions. Set the A·B·C switch to adjust the input sensitivity to a lower level. If the red light on the front of the transmitter unit **goes off** during play, the incoming signal is not strong enough. Set the A·B·C switch to adjust the input sensitivity to a higher level.

Setting the transmitting channel
In case of signal interference from the transmitter it is possible to change to another transmitting channel.

1 Switch off both active surround speakers.
2 Set the **CHANNEL** slide at the back of the transmitter to another number.
3 Set the **CHANNEL** slide at the back of both active surround speakers to the same number as on the transmitter.
4 Switch on both active surround speakers.

SETTING UP FB219W *(for model FW798W only)*

Note:

- *Always be sure that the transmitter and the active surround speakers are switched to the same transmitting channel, otherwise no sound or only a distorted sound will be heard on the surround speakers.*

Switching On-Standby-Off
The transmitter is equipped with a sensitive input. If there is no signal on the SUB and SURR input the transmitter and the surround speakers will switch to standby after approximately 100 seconds.

The green light on the front of the active surround speakers shows that the speakesr are on. If the red light is on, the speakers has switched to standby. To switch the active speakers off, use the POWER switch.

If the red light on the front of the transmitter is off, it has switched to standby. To switch the transmitter off, unplug the AC/DC adapter from the power source.

General Information

Any amplifier or receiver used at high power can produce distortions which may seriously damage your speakers. If distortion occurs, reduce the volume and the tone control to a level where the sound is acceptable again.

When using microphones, avoid feedback which occurs when a microphone picks up sound from the speakers, resulting in a howling noise. Keep the microphone away from the speakers or reduce the volume.

More wireless products ...
The transmitter is also equipped to drive an optional wireless subwoofer, wireless stereo speakers or wireless headphones.

Please ask your dealer about these products. Refer to the instructions provided with these products before using them with your transmitter.

DOLBY PRO LOGIC

Dolby Pro Logic

This state of the art Dolby Pro Logic mini system enables you to experience and enjoy a Home Cinema sound ambience. The Pro Logic system allows more accurate definition of the individual sound sources. It produces greater sound separation between channels and provides pinpoint sound localization. Pro Logic provides four sound outputs: Left, Center, Right and Surround (Rear). Front sounds are produced from the pair of Left and Right speakers and a Center speaker. The surround sound is reproduced by two speakers placed at the rear of the listening area. Although the surround sound is monaural (single-source), a pair of speakers is necessary to produce the correct diffused sound.

This Pro Logic decoder enables you to decode the following modes: ***Dolby Surround, Center Phantom, Dolby 3 Stereo*** or ***normal Stereo***.

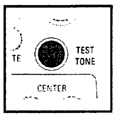
Test Tone

This feature enables you to adjust the Front Left, Front Right, Center and Surround Sound levels of the respective speakers in Dolby Pro Logic mode.

You must sit at the ideal sitting position and use the remote control to perform this operation.

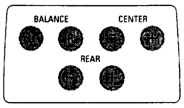
1 Press **CD**, **TUNER**, **TAPE** or **AUX** to switch on the system.

2 Press **TEST TONE**.



→ A test signal is generated; it will move through the Left, Center, Right, and Surround speakers, in that order.
→ "*TEST TONE*" followed by "*ADAPT BALANCE, CENTER AND REAR LEVEL*" will be displayed.
→ The test signal will last for about 90 seconds.

3 Press **BALANCE L** to adjust the sound of the front left speaker.



→ The display will show *BAL L+XX*.

4 Press **BALANCE R** to adjust the sound of the front right speaker.
→ The display will show *BAL R +XX*.

5 Press **CENTER** + or – to adjust the sound of the center speaker.
→ The display will show either *CENT +XX* or *-XX*.

6 Press **REAR** + or – to adjust the sound of the surround speakers.
→ The display will show either *REAR +XX* or *-XX*.

DOLBY PRO LOGIC

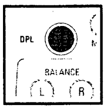
7 Adjust the sound of all the speakers until they are equal. When you are satisfied with the setting, press **TEST TONE** again to switch off the test signal.

Note:

- *It is advisable to set the speakers' level at normal listening level. "XX" denotes the sound level.*

When you have completed the Dolby Pro Logic setup, you are ready to enjoy Home Cinema sound.

- Press **DPL (PRO LOGIC)** repeatedly to select and cycle through the various sound modes.



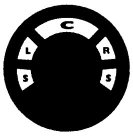
Dolby Surround → Center Phantom → Dolby 3 Stereo → Stereo → Dolby Surround ...

→ The Dolby Pro Logic display panel will light up with the selection.

Dolby Surround

This setting is for a full Dolby Surround Pro Logic mode.

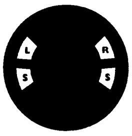
- Press **DPL** to select the Dolby Surround mode.
→ The message "*DOLBY SURROUND*" will be displayed.
→ The DPL display panel will light up.



Dolby Center Phantom

This setting is for use without the center speaker. It redistributes the center speaker sound to the left and right speakers, providing conventional stereo across the front.

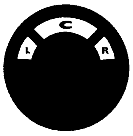
- Press **DPL** to select the Dolby Pro Logic Center Phantom mode.
→ The message "*CENTER PHANTOM*" will be displayed.
→ The DPL display panel will light up.



Dolby 3 Stereo

Use this setting when full surround is not required, but a wide stereo sound is desired. It only requires the left, right and center speakers.

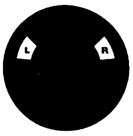
- Press **DPL** to select the Dolby 3 Stereo mode.
→ The message "*DOLBY 3 STEREO*" will be displayed.
→ The DPL display panel will light up.



Normal Stereo

This setting is for normal stereo sound without Dolby Pro Logic. It only requires the left and right speakers.

- Press **DPL** to select the Stereo mode.
→ The message "*STEREO*" will be displayed.
→ The DPL display panel will light up.



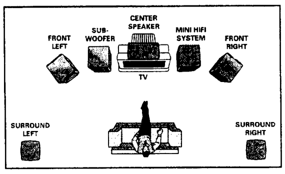
Important!

1 ***For the best Dolby Pro Logic sound, switch on DPL with DSC set to "Classic" and with Incredible Surround off.***

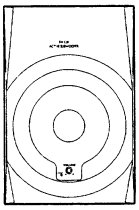
2 ***Dolby Pro Logic mode will automatically switch to normal Stereo mode when headphones are connected.***

3 ***Switch to normal stereo mode when you record on a tape.***

Setting up the Subwoofer



- Install the subwoofer wherever you like because with the bass sound range reproduced from the subwoofer (below 150Hz), human hearing cannot detect the direction and position in which the sound is being produced.
- Also, since the feeling of stereo is lost with bass frequencies, a single subwoofer is enough for reproducing the bass of stereo channels. However, you may install more than one subwoofer if your system has more than one subwoofer out jack.
- To obtain a better bass reproduction, we recommend that you install the subwoofer on a solid floor where resonance is unlikely to occur.
- Always place the subwoofer vertically, keeping a few centimeters from away the wall.
- Do not place an object on the subwoofer or sit on it.
- If the subwoofer is placed in the center of a room, the bass could be extremely weakened. This is due to the influence of the standing wave of the room. If this happened, move the subwoofer away from the center of a room or eliminate the cause of the standing wave, by installing a bookshelf on the wall, etc.



Important:
Before you operate the subwoofer, complete the preparation procedures.

Switch on your mini system and select the sound source.

AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

Switching the subwoofer ON

- Rotate **SUBWOOFER VOLUME** clockwise until there is a click.
  → The LED indicator lights up in green.

Switching the subwoofer to standby mode

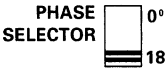
- Rotate **SUBWOOFER VOLUME** counter-clockwise until there is a click.
  → The LED indicator light turns red.

Volume Adjustment

You can adjust the subwoofer to suit the sound level of your front speakers. Reinforcing the bass sound gives you a greater sense of atmosphere.

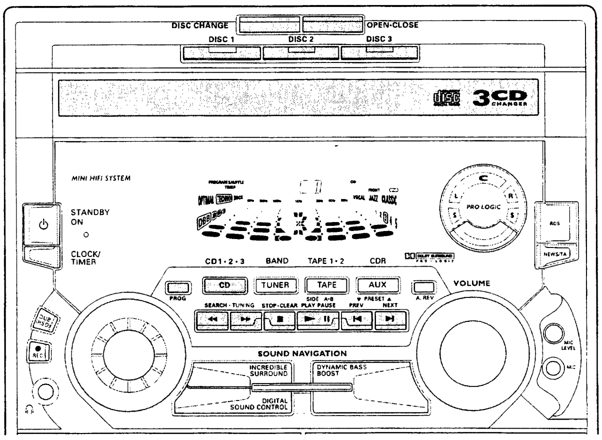
1. Adjust the **VOLUME** on the mini system until the sound from front speakers is not distorted. If it is distorted, the sound from the subwoofer will also be distorted.
2. Play your favourite songs. Male vocal tunes containing bass sounds are most suitable for adjustment.
3. Adjust the **SUBWOOFER VOLUME** to determine the loudness of the bass sound from the subwoofer.

Phase Selector



Use **PHASE SELECTOR** located at the rear of the subwoofer to select the phase polarity. Selecting the polarity at either 0° or 180° may determine better bass reproduction effect in certain listening environments (depending on the type of front speakers and the position of the subwoofer). It may also change the expense and tightness of sound, and affect the feeling of sound field. Select the setting that provides the sound you prefer when listening in your normal listening position.

Repeat the adjustment for Volume and Phase Polarity to suit your preference. Once you have adjusted the subwoofer to the settings you desire, use the VOLUME control on the mini system to adjust the volume of the subwoofer and the other speakers. You do not need to adjust the subwoofer settings again even when you change the volume level of the mini system.



Warning!

1. ***This system is designed for conventional CDs. Do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.***
2. ***Do not load more than one disc into each tray.***
3. ***When the CD changer is loaded with CDs, do not turn over or shake the system. This may jam the changer.***

You may load three discs in the CD changer for continuous playback without interruption.

Discs for playback

This system can play all audio CD, finalized audio CD-Recordable and finalized audio CD-Rewritable format discs.

COMPACT disc DIGITAL AUDIO
COMPACT disc DIGITAL AUDIO Recordable
COMPACT disc DIGITAL AUDIO ReWritable

Loading the CD Changer

1. Press **CD** to select CD mode.
2. Press **OPEN•CLOSE**.
   → The CD carousel slides out.
3. Load a CD with the printed side up in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press the **DISC CHANGE** button.
  → The CD carousel will rotate until the empty tray is ready for loading.

4. Press **OPEN•CLOSE** to close the CD carousel.
   → The total number of tracks and the playing time of the last selected disc appear on the display.

Note:
– *To ensure good system performance, wait until the CD changer completely reads the disc(s) before proceeding.*

CD Direct Play

You can play a CD directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.

– A lit button indicates that a disc is loaded in the disc tray.

Playing a CD

1. Press **PLAY ▶** to start playback.
   → The disc tray, track number and elapsed playing time of the current track appear on the display.
- To interrupt playback, press **PAUSE II**.
  → The playing time flashes.
- To resume playback, press **PLAY ▶** again.

2. To stop playback, press **STOP•CLEAR ■**.

Note:
– *All the available discs will play once, then stop.*

Disc Change

You can change the outer two discs while the third inner disc is stopped or is playing.

1. Press **DISC CHANGE**.
   → The CD carousel slides out.
2. Replace the discs in the left and right disc trays.
- If you press **DISC CHANGE** again during playback, the CD will stop playing.
  → The CD carousel will rotate until the inner tray is rotated out and is ready for loading.

3. Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track when playback is stopped

1 Press **PREV ⏮** or **NEXT ⏭** until the desired track appears on the display.
2 Press **PLAY ▶** to start playback.
   → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

- Press **PREV ⏮** or **NEXT ⏭** until the desired track appears on the display.
  → The selected track number and elapsed playing time appear on the display.
- If you press **PREV ⏮** once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible when playback is stopped. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "FULL".

1 Load the desired discs in the disc trays.
2 Press **PROGRAM** to start programming.
   → The PROGRAM flag starts flashing.
   → It will cancel any previously selected repeat mode.
3 Press the **CD** (CD 1•2•3) button to select the disc.
4 Press **PREV ⏮** or **NEXT ⏭** to select the desired track.
5 Press **PROGRAM** to store the track.
- Repeat steps *3* to *5* to store other discs and tracks.

6 Press **STOP•CLEAR ■** once to end programming.
   → The total number of tracks programmed and total playing time appear on the display.

Notes:
- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears in the display instead of the total playing time.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Reviewing the program

Reviewing of the program is possible only when playback is stopped.

- Press **PREV ⏮** or **NEXT ⏭** repeatedly to review the programmed tracks.
- Press **STOP•CLEAR ■** to exit review mode.

Playing the program

1 Press **PLAY ▶** to start program playback.
   → "PLAY PROGRAM" appears on the display.
   → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track will be played repeatedly.
  → The REPEAT and PROGRAM flags will be displayed.

2 Press **STOP•CLEAR ■** to stop program playback.

Note:
- *If you press any of the CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.*

Erasing the program *(when playback is stopped)*

- Press **STOP•CLEAR ■**.
  → "PROGRAM CLEARED" will be displayed.

Note:
- *The program will be erased when the system is disconnected from the power supply or when the CD carousel is opened. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "TRACKS CLEARED".*

Shuffle *(only on remote control)*

In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**.
   → "SHUFFLE" will be displayed.
   → The SHUFFLE flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will be played in random order until you press **STOP•CLEAR ■**.

- If you press **REPEAT** during shuffling, the current track will be played repeatedly.
  → The REPEAT and SHUFFLE flags will be displayed.

2 Press **SHUFFLE** again to resume normal playback.
   → The SHUFFLE flag disappears from the display.

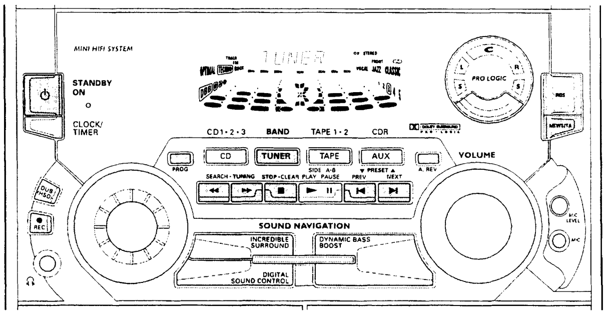
Repeat *(only on remote control)*

You can play the current track repeatedly.

1 Press **REPEAT** on the remote control during CD playback to select the repeat mode.
   → "TRACK" will be displayed.
   → The REPEAT flag appears on the display.
- The selected track will now be played repeatedly until you press **STOP•CLEAR ■**.

2 Press **REPEAT** again to resume normal playback.
   → The REPEAT flag disappears from the display.

TUNER



Note:
- *For 'EASY SET' feature, please refer to page 18.*

Tuning to radio stations

1 Press **TUNER** (BAND) to select TUNER mode.
   → "TUNER" will be displayed.
   A few seconds later, the current radio frequency will be displayed.
2 Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.
3 Press **TUNING** ◀◀ or ▶▶ for more than one second, then release.
   → The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press **TUNING** ◀◀ or ▶▶ repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **TUNER** (BAND).
2 Press **PROGRAM** for more than one second.
   → The PROGRAM flag starts flashing and "AUTO" will be displayed.

→ The system will search for every available station in the FM waveband first, then search by the MW and LW wavebands.
→ All available radio stations will be stored automatically. The frequency and preset number will be displayed briefly.
→ The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
→ The system will remain tuned to the last stored preset radio station.

Notes:
- *You can cancel the automatic programming by pressing PROGRAM or STOP•CLEAR ■ (on the system only).*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming; only the preset numbers 10 to 40 will be programmed.*

Manual programming

1 Press **TUNER** (BAND).
2 Press **TUNER** (BAND) again to select the desired waveband : FM, MW or LW.
3 Press **PROGRAM** for less than one second.
→ The **PROGRAM** flag starts flashing.
→ The next available preset number will be displayed for selection.
4 Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.
- If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.

5 Press **PROGRAM** again.
→ The **PROGRAM** flag disappears and the radio station will be stored.
- Repeat the ***steps 3 – 5*** to store other preset radio stations.

Notes:
- *When 40 radio stations are stored and you attempt to store another radio station, the display will show "FULL ". If you want to change an existing preset number, repeat steps 3 – 5.*
- *You can cancel manual programming by pressing STOP•CLEAR ■ (on the system only).*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press **PRESET** ▼ or ▲ to select the desired preset number.
→ The preset number, radio frequency, and waveband appear on the display.

Receiving RDS Radio Station

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The radio station name is displayed.
- **FREQUENCY:** The frequency of the radio station is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (and the radio station name will appear on the display:

- The display normally shows the radio station name if available. By repeatedly pressing **RDS** button you can change the type of display information:
→ The display shows in turn: STATION NAME → PROGRAM TYPE → RADIO TEXT → FREQUENCY → STATION NAME ...

Note:
- *When you press the RDS button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

RDS Clock

Some RDS station may be transmitting a real clock time at an interval of every minute.

Setting the time with RDS clock

1 Press **CLOCK/TIMER**.
→ "- - : - -" or current time appears on the display.
2 Press **CLOCK/TIMER** once more to enter clock setting mode.
→ "00:00" or current time starts flashing.
3 Press **RDS**.
→ The message "SEARCH RDS TIME" will be displayed.
→ If the station does not transmit RDS clock, "NO RDS TIME" will be displayed.
→ When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.
→ If within 90 seconds, the RDS time is not detected, "NO RDS TIME" will be displayed.

News/TA (Traffic Announcement) *(only available in Radio Station with RDS)*

You can activate NEWS or TA function in Standby, Demonstration or any source mode except Tuner mode. Once the News Program Type (for NEWS function) or Traffic Announcement data (for TA function) is detected in any of the selected RDS stations, it will switch to TUNER mode automatically.

NEWS/TA key toggles in the following sequence :

NEWS → TA → OFF → NEWS

To start NEWS or TA function

1 Press **NEWS/TA** to select NEWS function.
→ The **NEWS** flag and "NEWS" will be displayed.
- If you want to select TA function, press **NEWS/TA** again.
→ The **TA** flag and "TA" will be displayed.

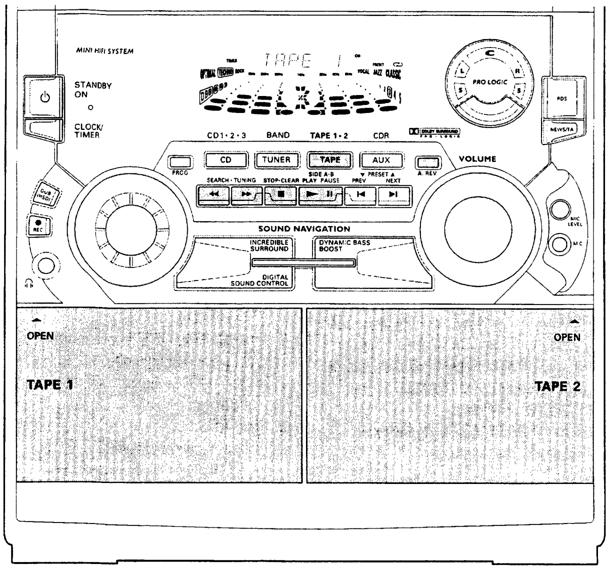
2 When NEWS or TA is selected;
- It will search for the first 5 preset RDS stations and wait for the News Program Type / Traffic Announcement data to be available in any of these RDS stations. During the search :
→ The current source activity will remain uninterrupted.
→ If no RDS station is found in the first 5 presets after the search, the NEWS/TA function will be switched off. The display will show "NO RDS NEWS" or "NO RDS TA" and **NEWS** or **TA** flag will disappear from the display.
- When NEWS/TA transmission is detected, the system will switch to Tuner mode.
→ The **NEWS** or **TA** flag starts flashing.

To cancel NEWS or TA function

- Press **NEWS/TA** until the **NEWS** or **TA** flag disappears and "TA OFF" is displayed.

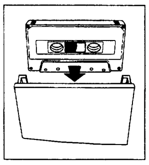
Notes:
- *If you are listening to a non RDS TUNER radio station and should you decide to hear NEWS or TA, first select other source (e.g. CD, TAPE or AUX), then press NEW/TA.*
- *Before using the NEWS or TA feature, ensure that the first 5 presets are RDS stations.*
- *The NEWS/TA works only once for each activation.*
- *During News bulletin or Traffic Announcement, you can press any available source or Tuner function keys to cancel NEWS/TA function and execute the relevant source mode.*
- *If set is switched to Tuner source, the NEWS/TA function will be cancelled, "NEWS OFF" or "TA OFF" will be displayed immediately after the "TUNER" message.*

TAPE


MINI HIFI SYSTEM
STANDBY
ON
CLOCK/
TIMER
TAPE 1
PRO LOGIC
RDS
NEWS/TA
CD1•2•3
BAND
TAPE 1•2
CDR
CD
TUNER
TAPE
AUX
VOLUME
PROG
SIDE A B
PRESET
A. REV
SEARCH·TUNING
STOP·CLEAR
PLAY PAUSE
PREV
NEXT
SOUND NAVIGATION
INCREDIBLE SURROUND
DYNAMIC BASS BOOST
DIGITAL SOUND CONTROL
MIC LEVEL
MIC
REC
OPEN
OPEN
TAPE 1
TAPE 2

Loading a tape

- Press **OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.



Tape Playback

1 Press **TAPE** (TAPE 1•2) to select TAPE mode.
→ "TAPE 1" or "TAPE 2" will be displayed.

- Press **TAPE** (TAPE 1•2) again to select either tape deck 1 or tape deck 2.

2 Load the tape into the desired tape deck.

3 Press ▶ to start playback.

3a *(For Tape Deck 2 only)*
Press ▶ (SIDE A•B) again to switch playback between side A and B.
→ The **BACK** or **FRONT** flag appears on the display, depending on the side selected.

3b *(For Tape Deck 2 only)*
Press **A. REV** to select the different type of playback mode *(see auto reverse playback)*.

4 Press ■ to end playback.

Note:
– *To change side before playback begins, use the SIDE button on the remote control.*

Auto Reverse Playback *((only on tape deck 2)*

- Press **A. REV** to select the different playback modes.

⊏ ...... to record or playback on one side of the tape. The tape stops at the end of one side.

⊐ ..... to record or playback on both sides of the tape. The tape then stops.

⊂⊃ .. to playback continuously on both sides of the tape up to a maximum of 10 times per side unless you press ■.

Rewind/Fast Forward *(only on tape deck 2)*

When playback is stopped

1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
→ "<<<" or ">>>" will be displayed depending on which button is pressed.
→ The tape will stop automatically at the end of the rewinding or fast forwarding.

2 Press ■ to stop rewinding or fast forwarding.

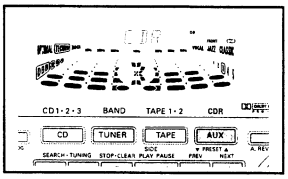
TAPE

During playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → During searching, the sound is reduced to a low volume.
  → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
– *During rewinding or fast forwarding of a tape, it is also possible to select another source (e.g. CD, TUNER, or AUX).*
– *Before use, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.*
– *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
– *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV, or speaker).*

AUX


CDR
CD1•2•3
BAND
TAPE 1•2
CDR
CD
TUNER
TAPE
AUX
SEARCH·TUNING
STOP·CLEAR
PLAY PAUSE
SIDE
PREV
PRESET
NEXT
A. REV

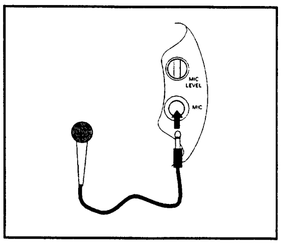
Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player, or CD Recorder) to the AUX IN terminals, you can hear the enhanced sound from the system.

- Press **AUX** to select the external (normal AUX) mode.
  → "AUX" will be displayed.
- Press **AUX** again to select CDR mode.
  → "CDR" will be displayed.

Notes:
– *There are two AUX modes:*
  i. the normal AUX mode.
  ii. the CDR mode, where the LINE OUT of this mini system is muted. You will not be able to record or listen to the sound from the LINE OUT.
– *You are advised not to listen to and record from the same source simultaneously.*
– *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

KARAOKE


MIC LEVEL
MIC

Microphone Mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.

2 Connect a microphone to the **MIC** socket.

3 Press **CD**, **TUNER**, **TAPE** or **AUX**.

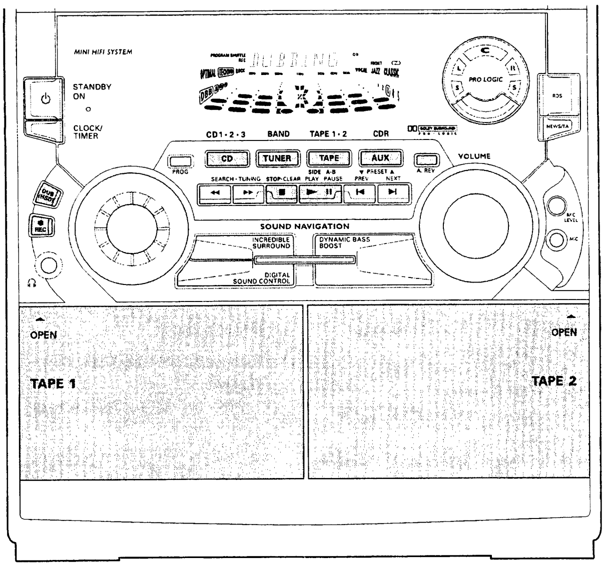
4 Play the selected source.

5 Adjust the volume level with **VOLUME** control.

6 Adjust the **MIC LEVEL** control to the mixing level that you want.

7 Start singing or talking through the microphone.

Note:
– *Keep the mic away from the speakers to prevent howling.*



SWITCH OFF DOLBY PRO LOGIC WHEN RECORDING

Notes:
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape) or IEC type II (CrO_2).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for 6 to 7 seconds.*
- *The recording level is set automatically, regardless of the position of Volume, DBB, Incredible Surround or DSC.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO_2 tape detection hole when covering the tab opening.*

Recording from other sources

(only on tape deck 2)

1. Press **TAPE** (TAPE 1•2) to select tape deck 2.
2. Load a blank tape into tape deck 2 with the open side downward.
3. Press **SIDE** on remote control to select the recording side.
   → The **BACK** or **FRONT** flag will be displayed, depending on the side selected.
4. Press **A. REV** to select the playback mode (⊐ or ⊐⊃).
5. Press **CD**, **TUNER** or **AUX**.
- Start playback of the selected source.
6. Press **REC** to start recording.
   → The **REC** flag starts flashing.
7. Press ■ to stop recording.

Notes:
- *Only ⊐ or ⊐⊃ mode is available during recording .*
- *During recording, it is not possible to listen to another source.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

1. Press **TAPE** (TAPE 1•2) to select tape deck 2.
2. Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2.
   → Make sure both tapes have their full spool to the left.
3. Press **SIDE** on the remote control to select the recording side.
4. Press **DUB (HSD)** ***once*** for normal speed dubbing or ***twice*** *(within 2 seconds)* for high speed dubbing.
   → "NORMAL" (normal speed) or "FAST" (high speed) will be displayed, followed by "DUBBING".
   → The **HSD** flag appears on the display during high speed dubbing.
- Dubbing will start immediately.
  → The **REC** flag starts flashing.
5. Press ■ to stop dubbing.

Notes:
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
- *You can listen to another source while dubbing.*

CD Synchro Start Recording

1. Load a blank tape into tape deck 2 and a disc into a disc tray.
2. Press **CD** to select CD mode.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If you do not, the tracks are recorded according to the order on the selected disc.
3. Press **REC** to start recording.
   → The **REC** flag starts flashing.
- CD will start playback automatically.
4. Press ■ to stop recording.

Recording the mixed sound / One Touch Recording

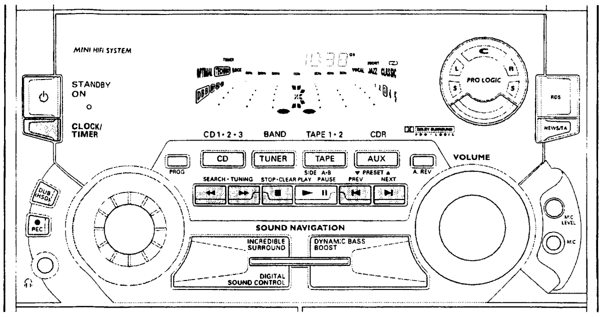
- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
- For One Touch Recording, as soon as you press **REC**, the current source (CD, TUNER or AUX) will be recorded on tape deck 2

1. Load a blank tape in tape deck 2.
2. Press **REC** to start recording.
   → The **REC** flag starts flashing.
3. Press ■ to stop recording.

Note:
- *When you press RECORD while in TAPE mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in TAPE mode.*

CLOCK

TIMER



Viewing the Clock

You can view the clock (if it is set) while the system is in standby mode or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK/TIMER** briefly *(on the system only)*.
  → " 10:38" (the current time) will be displayed.
  → "--:--" will be displayed if the clock is not set.

Setting the Clock

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK/TIMER** to select clock mode.
→ "00:00" or the current time starts flashing.
2 Set the hour with ◀◀ or ▶▶.
3 Set the minute with I◀ or ▶I.
4 Press **CLOCK/TIMER** again to store the setting.
→ The clock starts.

- To exit without storing the setting, press ■ on the system.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When a power interruption occurs, the clock setting is erased.*
- *To set the time with RDS clock, see "Receiving RDS Radio Station" under TUNER section.*

Timer Setting

- The system can switch on to CD, TUNER, or TAPE 2 mode automatically at a preset time. It can serve as an alarm to wake you up.
- Before setting the timer, make sure the clock is set correctly.
- The timer will always be switched on once it is set.
- **The volume of the timer will start to increase from the minimum level until the volume level before the set is switched to standby mode.**

1 Press and hold **CLOCK/TIMER** for more than 2 seconds to select timer mode.
→ "00:00" or the last set timer starts flashing. The **TIMER** flag flashes.
→ The last selected source is lit while other available sources are flashing.
2 Press **CD**, **TUNER** or **TAPE** to select the desired source.
- Before selecting CD or TAPE, make sure a CD or tape is loaded in the CD tray or tape deck 2.

3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press I◀ or ▶I to set the minute for the timer to start.
5 Press **CLOCK/TIMER** to store the start time.
→ The timer is now set.
→ The **TIMER** flag remains on the display.

- To exit without storing the setting, press ■ on the system.
- At the preset time, the timer will be activated.
  → The selected source will be played.

Notes:
- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*
- *If the source selected is TAPE, and if the preset time is reached during high speed dubbing, the TUNER will be selected instead.*

TIMER

SLEEPTIMER

To switch off the TIMER
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press ■ on the system to cancel the timer.
→ The timer is now switched off.
→ The display will show "OFF" and the **TIMER** flag disappears.

To start the TIMER again *(for the same preset time and source)*
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press **CLOCK/TIMER** again to store the start time.
→ The timer is now switched on.
→ The **TIMER** flag appears on the display.

Sleep Timer *(only on remote control)*

This feature allows you to select a length of time after which the system will switch to the standby mode automatically.

- Press **SLEEP TIMER** on the remote control repeatedly to select a period of time.
  → The selections are as follows (time in minutes):
  60 → 45 → 30 → 15 → OFF → 60 ...
  → "SLEEP XX" or "OFF" will be displayed. "XX" is the time in minutes.
- When you reach the desired lengthof time, stop pressing the **SLEEP TIMER** button.
  → After this amount of time passes, the system will switch to the standby mode.

To switch off the Sleep Timer
- Press **SLEEP TIMER** repeatedly until "OFF" is displayed, or press the **STANDBY ON** button.

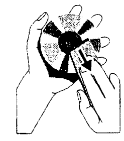
MAINTENANCE

Maintenance

Cleaning the Cabinet

- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs



- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens

- After prolonged use, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with the cleaner.

Cleaning the Heads and the Tape Paths

- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape once.

Demagnetizing the heads

- Use a demagnetizing tape available at your dealer.

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- A chamois leather slightly moistened with water is sufficent for cleaning the speaker cabinet. Do not use cleaning agents containing alcohol, spirits, ammonia or abrasives.
- Do not leave the speakers for a long time in direct sunlight or other places where high temperatures can occur.
- Do not expose the speakers to humidity or rain.

TROUBLESHOOTING

WARNING! Under no circumstances you should try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.

- The disc is inserted upside down.

→ *Place CD with printed side up.*

- Moisture condensation at the lens.

→ *Wait until lens has adjusted to normal room temperature.*

- There is no disc in the CD tray.

→ *Insert a CD.*

- The CD is dirty, badly scratched or warped.

→ *Clean or replace the CD.*

- The CD lens is dirty or dusty

→ *See section under Maintenance.*

"DISC NOT FINALISED" is displayed.

- The CD-RW or CD-R disc is not properly recorder for the use on a standard CD player.

→ *Read the instruction booklet of your CD-ReWriteable or CD-Recorder on how to finalize a recordeing.*

- The CD is badly scratched or dirty.

→ *Replace or clean CD.*

Radio Reception

Poor radio reception.

- The signal is too weak.

→ *Adjust the antenna.*

→ *Connect an external antenna for better reception.*

- The TV or VCR is too close to the stereo system.

→ *Separate the stereo system from the TV or VCR.*

"NO RDS TEXT" is displayed.

- RDS text message is not available.

→ *Select another RDS station.*

Tape Deck Operation

Recording or playback cannot occur or there is a decrease in audio level.

- Dirty tape heads, capstans or pressure rollers.

→ *See section on tape deck maintenance.*

- Magnetic build-up in the record/playback head.

→ *Use demagnetizing tape.*

General

System does not react when any button is pressed.

- Electrostatic discharge.

→ *Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.*

No or poor sound.

- Volume is not turned up.

→ *Adjust the volume.*

- The headphones are connected.

→ *Disconnect the headphones.*

- Speakers are not connected or are connected wrongly.

→ *Check that the speakers are connected correctly.*

→ *Make sure the stripped speaker wire is clamped.*

Reversed left and right sound.

- Speakers are connected wrongly.

→ *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Speakers are connected wrongly.

→ *Check the speaker connection for proper phasing, red/black wires to red/black terminals.*

Remote control has no effect on the system.

- Wrong source is selected.

→ *Select the source (CD, TUNER, etc.) before pressing the function button, (PLAY, PREV/NEXT, etc.).*

- The distance to the system is too large.

→ *Reduce the distance.*

- Batteries are inserted incorrectly.

→ *Insert the batteries with their polarities (+/– signs) as indicated.*

- Batteries are exhausted.

→ *Replace the batteries.*

Timer is not working.

- Clock is not set.

→ *Set the clock.*

- Timer is not switched on.

→ *Press CLOCK/TIMER to switch on the timer.*

- Dubbing/recording is in progress.

→ *Stop dubbing/recording.*

Clock setting is erased.

- There was a power failure.

→ *Reset the clock.*

System displays features automatically; buttons flash continuously.

- Demonstration mode is switched on.

→ *Press and hold ■ (on the system) for 5 seconds to switch off the demonstration.*

There is a howling sound at the external source.

- You hear feedback when you are listening and recording from the same source simultaneously.

→ *Press AUX to select CDR mode.*

All lighted buttons are not lit.

- Equalizer Display is switched on in NITE mode.

→ *Rotate JOG to other Equalizer Display.*

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No sound.

- VOLUME is not correctly adjusted.
- → *Adjust the VOLUME.*
- Headphones are connected to the appliance.
- → *Disconnect headphones.*
- Speakers are not (or wrongly) connected.
- → *Connect the speakers securely.*

No sound on the left or right side.

- One speaker is wrongly connected.
- → *Connect the speaker properly.*
- A speaker cable is damaged.
- → *Replace the cable.*

Poor sound or no sound at the center or surround speakers.

- SURROUND mode is not switched on.
- → *Switch to the surround mode on the appliance.*
- Surround and/or center speakers are not (properly) connected.
- → *Connect the speakers properly.*
- A speaker cable is damaged.
- → *Replace the cable.*
- Transmitter or active surround speakers are switched off.
- → *Switch on transmitter and active surround speakers.*
- Transmitter and/or active surround speakers are not securely connected to the power source.
- → *Connect the power cables properly.*
- CHANNEL slides of the transmitter and the active speakers are not switched to the same number.
- → *Set the CHANNEL slides on the transmitter and on both active speakers to the same number.*
- Transmitter is connected to the wrong terminal on the appliance.
- → *Connect the transmitter to the correct terminal on the appliance.*
- SURR/MULTI switch of the transmitter is in the wrong position.
- → *Set the SURR/MULTI switch to the SURR position.*
- The signal from the transmitter is interferred through electric appliances.
- → *Set the transmitter and the active surround speakers to another transmitting channel.*
- The signal from your appliance is too strong.
- → *Set the input sensitivity of the transmitter to the next level.*

Poor bass sound.

- Speakers are not in phase.
- → *Connect speakers properly; colored cable to ⊕-pole, black cable to ⊖-pole.*

Bad sound.

- Setting does not match for the given type of music or sound.
- → *Correct the sound settings on the appliance.*

Surround sound level is too low or too high.

- The level of the surround sound is not properly adjusted.
- → *Adjust the level and delay time of the surround sound on the appliance.*

Center sound level is too low or too high.

- The sound level of the center channel is not properly adjusted.
- → *Adjust the level of the center channel on the appliance.*

Subwoofer

There's no sound.

- Check that this subwoofer and components are connected correctly and securely.
- → *Adjust the volume.*

The sound is distorted.

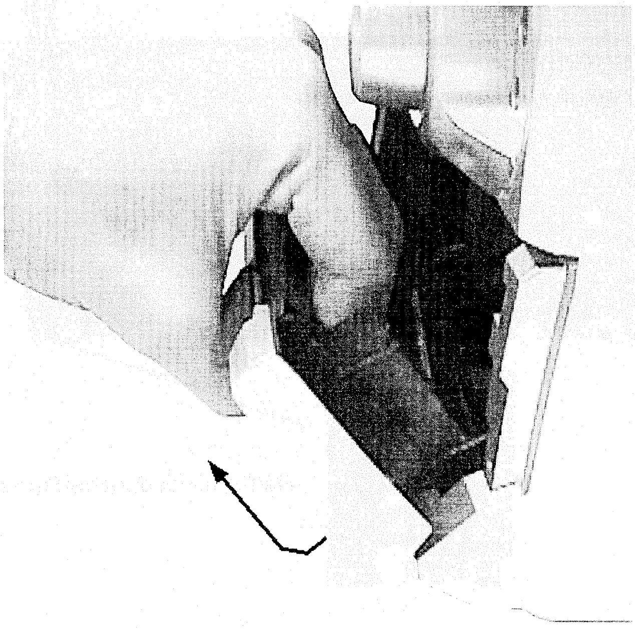
- The input signal is imperfect, distorted or the input signal level is too high.
- → *Adjust the subwoofer volume level.*

In case color irregularity is observed on the nearby TV screen

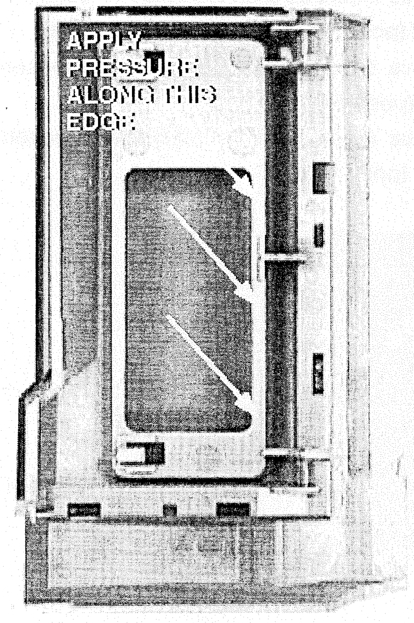
- The subwoofer and the TV is too close.
- → *Place the subwoofer further from the TV set.*

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover



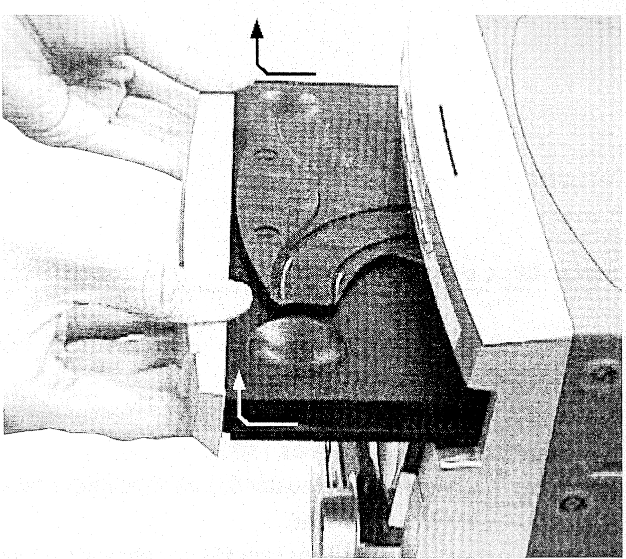
Remove Cassette Door



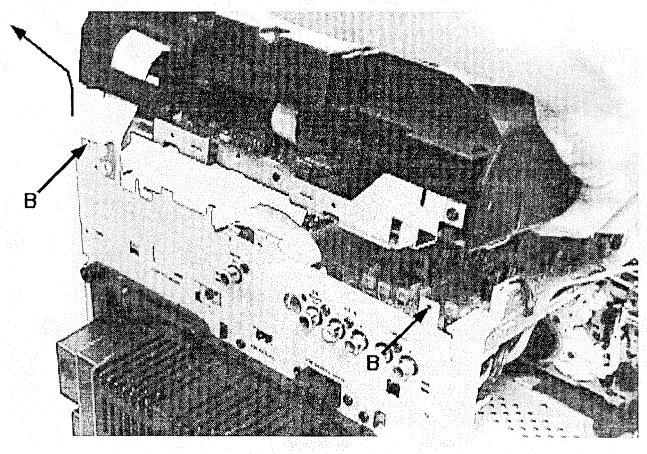
Cassette Door

Dismantling of the CDC Module and Front Panel

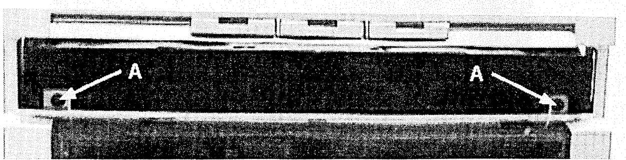
1) Loosen the 17 screws to remove the Cabinet Rear (pos 259) of the set :-
    - 5 screws each on the left side & right side of the Cabinet Rear.
    - 7 screws at the rear of the Cabinet Rear.
2) Slide out the CDC tray and remove the Cover CDC (pos 107) as indicated.
3) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
4) Remove 1 screw (pos 305) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos 231).



Remove Cover CDC



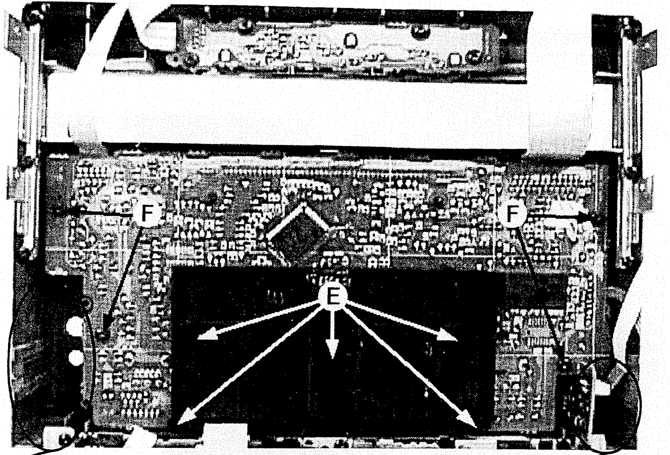
Remove CDC Module

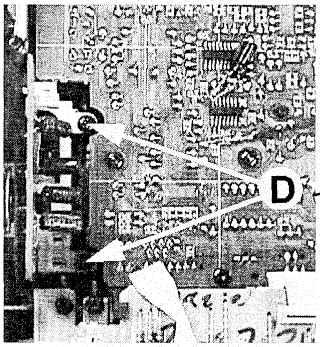


Front CDC

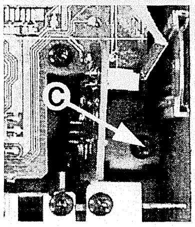
Dismantling of the Front Board

1) Remove 1 screw C as indicated to loosen the Headphone Board (pos 1101-A).
2) Remove 2 screws D as indicated to loosen the Karaoke Board (pos 1102-C) for set with karaoke.
3) Remove 5 screws E as indicated to loosen the Plate Front (pos 254).
4) Remove 4 screws F as indicated to loosen the Front Board (pos 1102-A).





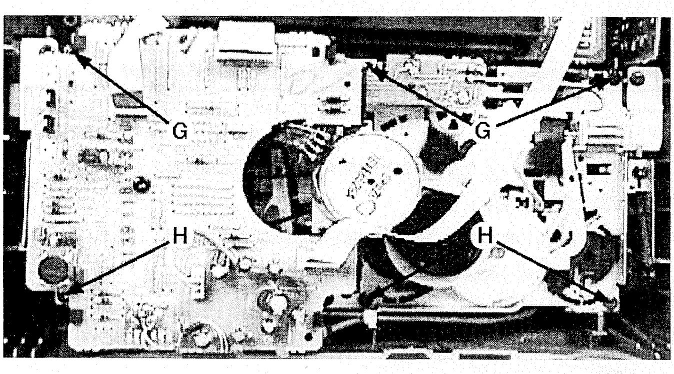
Remove Karaoke Board



Remove Headphone Board

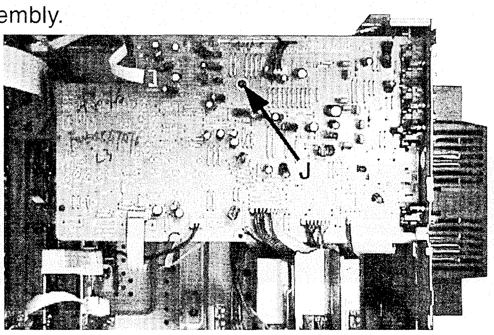
Dismantling of the ETF Module

1) Remove 6 screws (3 screws G and 3 screws H) as indicated to loosen the ETF6 Module (pos 1105).

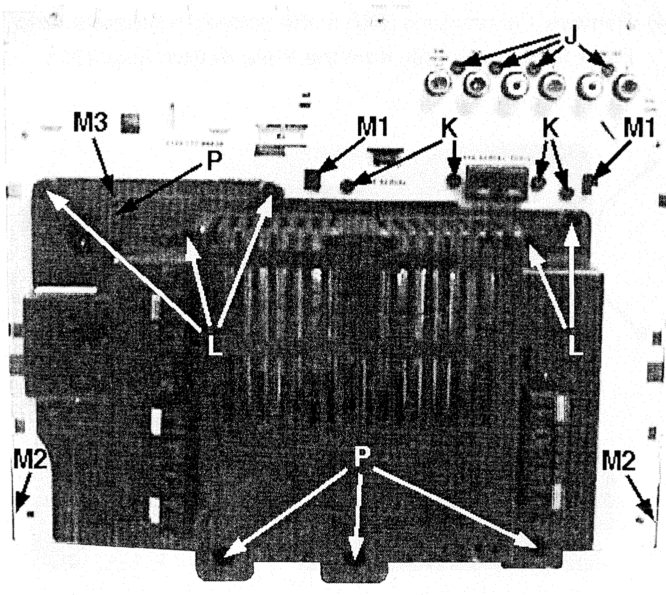


Dismantling of Rear Portion

1) Remove 5 screws J as indicated to loosen the AF Board (pos 1101-B).
2) Remove 4 screws K and uncatch M1 as indicated to loosen the Tuner Board (pos 1100).
3) Remove 5 screws L and uncatch M2 as indicated to take out the Plate Rear(pos 229).
4) Remove 4 screws P and uncatch M3 as indicated to free the Power Module (pos 1103) from the Bottom Plate assembly.



Top View



Repair Hints

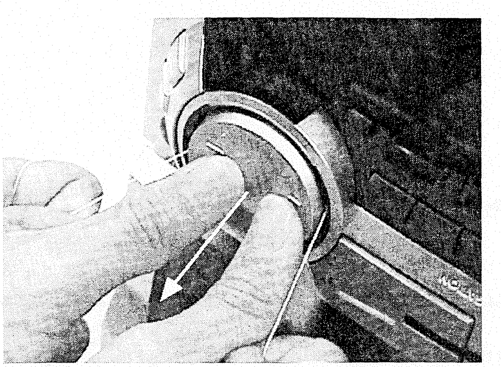
1) The Jog Rotary (pos 142) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 1.

2) During re-assembly of the Power Module, place the Bracket Mains Socket (pos 232) behind the Mains Socket and catch it onto the Rucksack (pos 1103-201)of the Power Module. See pictures 2 and 3.

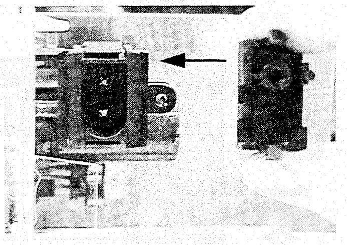
3) During re-assembly of the set, care should be taken to dress all the flex cable wires properly to prevent any damaged cause by any sharp metal edges or any other metal parts. See picture 4.

4) Due to the short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 5.

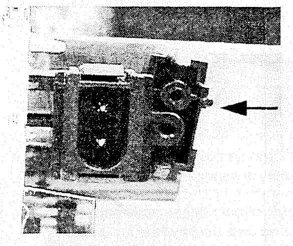
5) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.



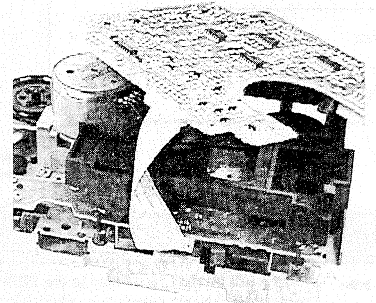
Picture 1



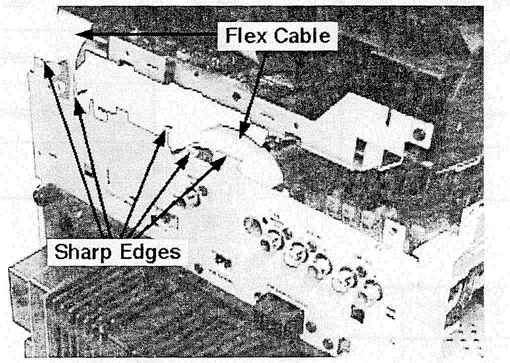
Picture 2



Picture 3

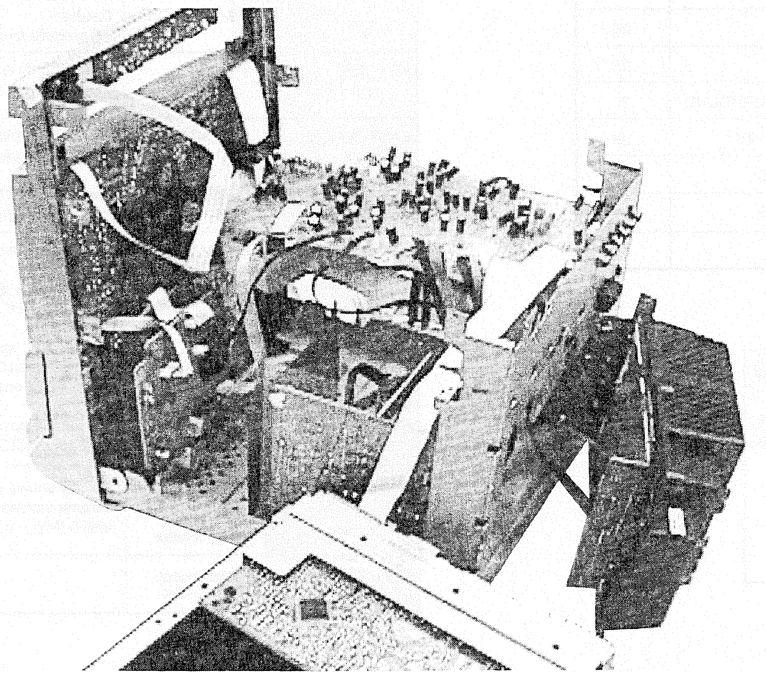


Picture 5

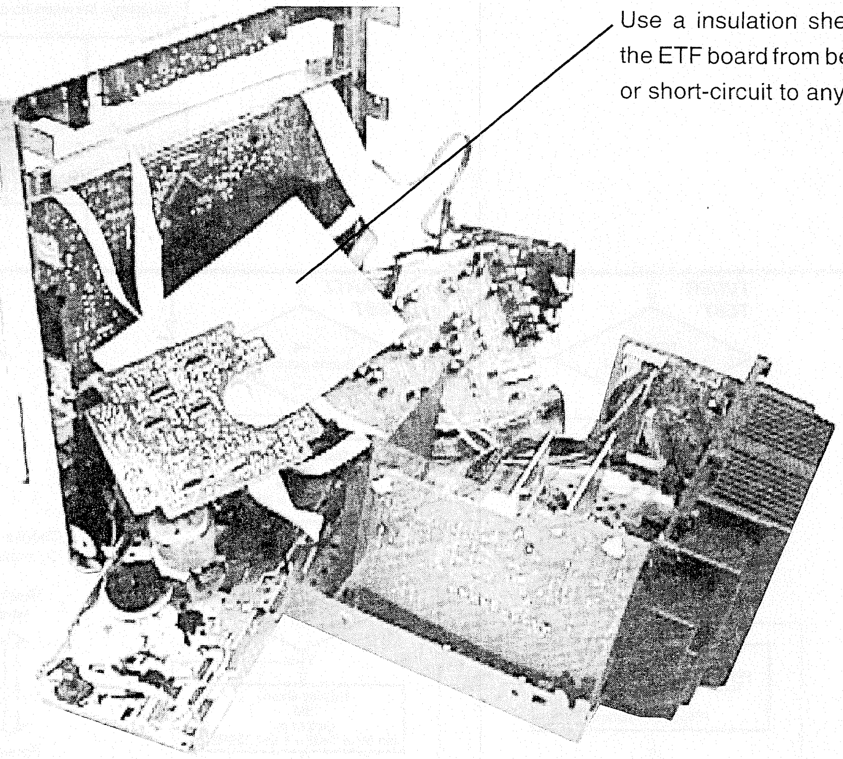


Picture 4

Service pos A

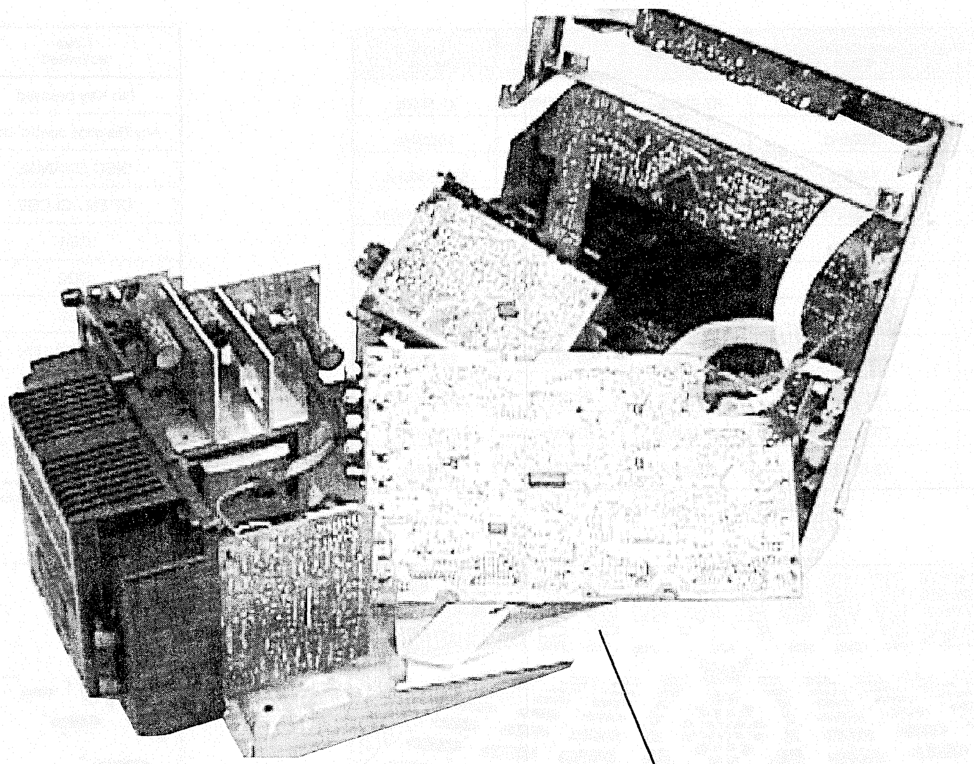


Service pos B



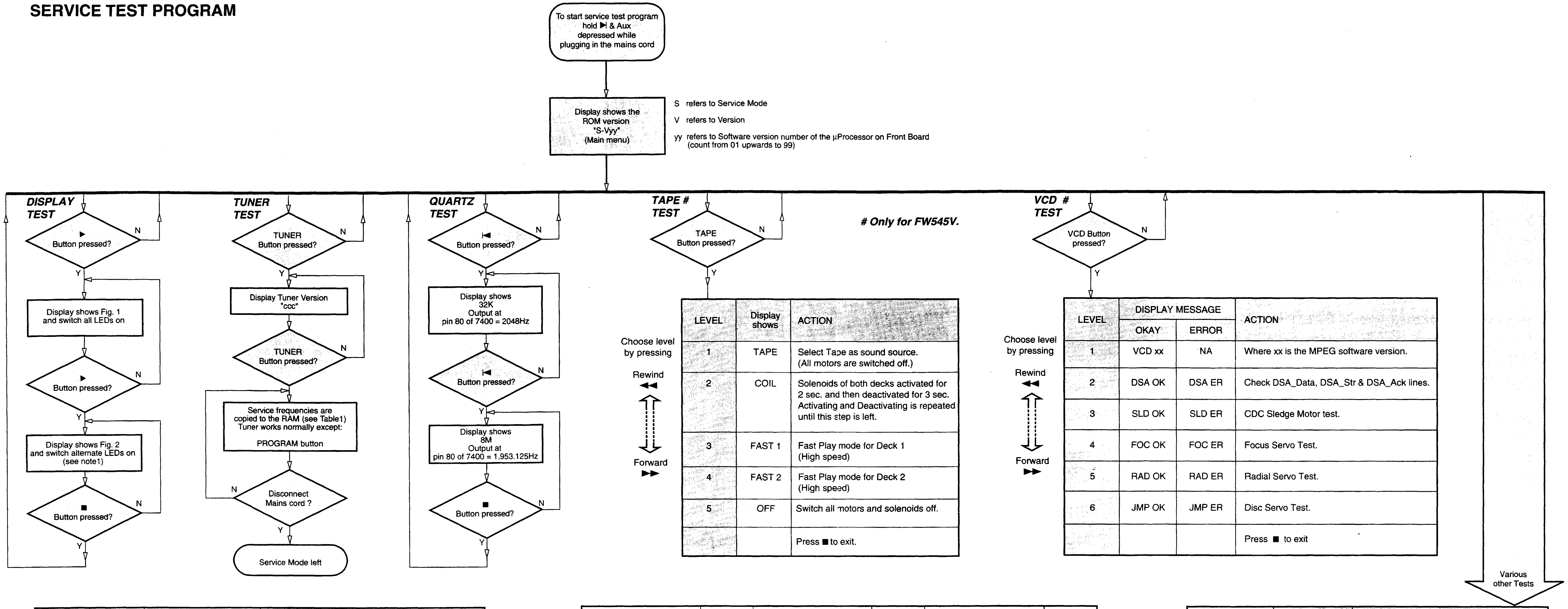
Use a insulation sheet to prevent the ETF board from being damaged or short-circuit to any metal parts.

Service pos C



Use a insulation sheet to prevent the AF board from being damaged or short-circuit to any metal parts.

SERVICE TEST PROGRAM


To start service test program hold ▶| & Aux depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
DISPLAY TEST
▶ Button pressed?
N
Y
Display shows Fig. 1 and switch all LEDs on
▶ Button pressed?
Display shows Fig. 2 and switch alternate LEDs on (see note1)
■ Button pressed?
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
|◀ Button pressed?
Display shows 32K Output at pin 80 of 7400 = 2048Hz
|◀ Button pressed?
Display shows 8M Output at pin 80 of 7400 = 1,953.125Hz
■ Button pressed?
TAPE # TEST
TAPE Button pressed?
Choose level by pressing
Rewind
◀◀
Forward
▶▶
VCD # TEST
VCD Button pressed?
Choose level by pressing
Rewind
◀◀
Forward
▶▶
Various other Tests

S refers to Service Mode

V refers to Version

yy refers to Software version number of the µProcessor on Front Board (count from 01 upwards to 99)

# Only for FW545V.

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec. Activating and Deactivating is repeated until this step is left.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off.
		Press ■ to exit.

LEVEL	DISPLAY MESSAGE		ACTION
	OKAY	ERROR	
1	VCD xx	NA	Where xx is the MPEG software version.
2	DSA OK	DSA ER	Check DSA_Data, DSA_Str & DSA_Ack lines.
3	SLD OK	SLD ER	CDC Sledge Motor test.
4	FOC OK	FOC ER	Focus Servo Test.
5	RAD OK	RAD ER	Radial Servo Test.
6	JMP OK	JMP ER	Disc Servo Test.
			Press ■ to exit

TEST	***Activated with***	***ACTION***
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT TEST	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	▶| ■ to Exit	Key numbers according table 2 are shown on the display.
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
ADC TEST	AUX ■ to Exit	The display shows "ADC1_ww". Press AUX to shows "ADC2_xx", "ADC3_yy" and "ADC4_zz" for an input signal between 0 and 5V, where "ww", "xx", "yy" and "zz" is the ADC value between 0 - 63 representing NTC, SA_1, SA_2 and SA_3 lines respectively. The set will go to standby when temperature is too high (NTC line ADC value is below 19).
VOLUME TEST	Rotary Volume Knob or Jog Shuttle	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

PRESET	Europe "EUR"	East Europe Extended-band "EAS"	East Europe "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	531/530kHz
4	1602kHz	87.5MHz	1602kHz	1700kHz	1602/1700kHz
5	558kHz	531kHz	558kHz	560kHz	558/560kHz
6	1494kHz	1602kHz	1494kHz	1500kHz	1494/1500kHz
7	153kHz	558kHz	87.5MHz	98MHz	87.5MHz
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	87.5MHz	65.81MHz	98MHz	87.5MHz	98MHz

Table 1

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	RDS *	10	◀◀	21
Any Remote control key	RC	DOLBY B *	11	▶▶	22
DISC CHANGE	1	JOG UP *	12	■ (Exit Test)	
OPEN / CLOSE	2	PROGRAM	13	▶II	24
CD1	3	CD	14	|◀	25
CD2	4	TUNER	15	▶|	26
CD3	5	TAPE	16	INCREDIBLE SURROUND *	27
STANDBY / ON	6	AUX	17	JOG DOWN *	28
CLOCK / TIMER	7	TAPE MODE *	18	DSC	29
DPL *	8	TAPE DUBBING *	19	DBB	30
NEWS *	9	RECORD *	20		

* Not for all type/version.

Table 2

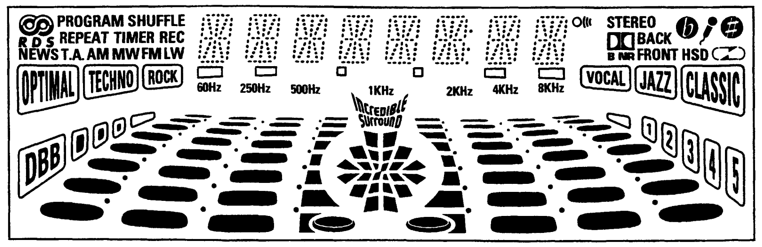
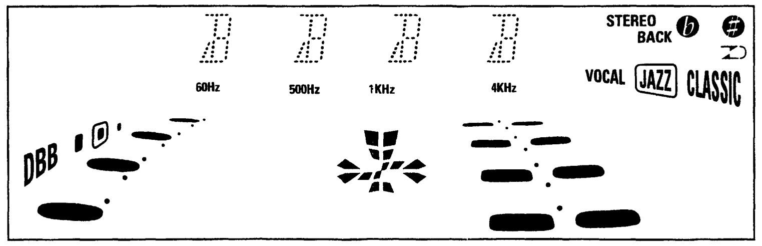

PROGRAM SHUFFLE
REPEAT TIMER REC
RDS
NEWS T.A. AM MW FM LW
OPTIMAL
TECHNO
ROCK
60Hz
250Hz
500Hz
1KHz
2KHz
4KHz
8KHz
STEREO
BACK
FRONT HSD
VOCAL
JAZZ
CLASSIC
INCREDIBLE SURROUND
DBB
1
2
3
4
5

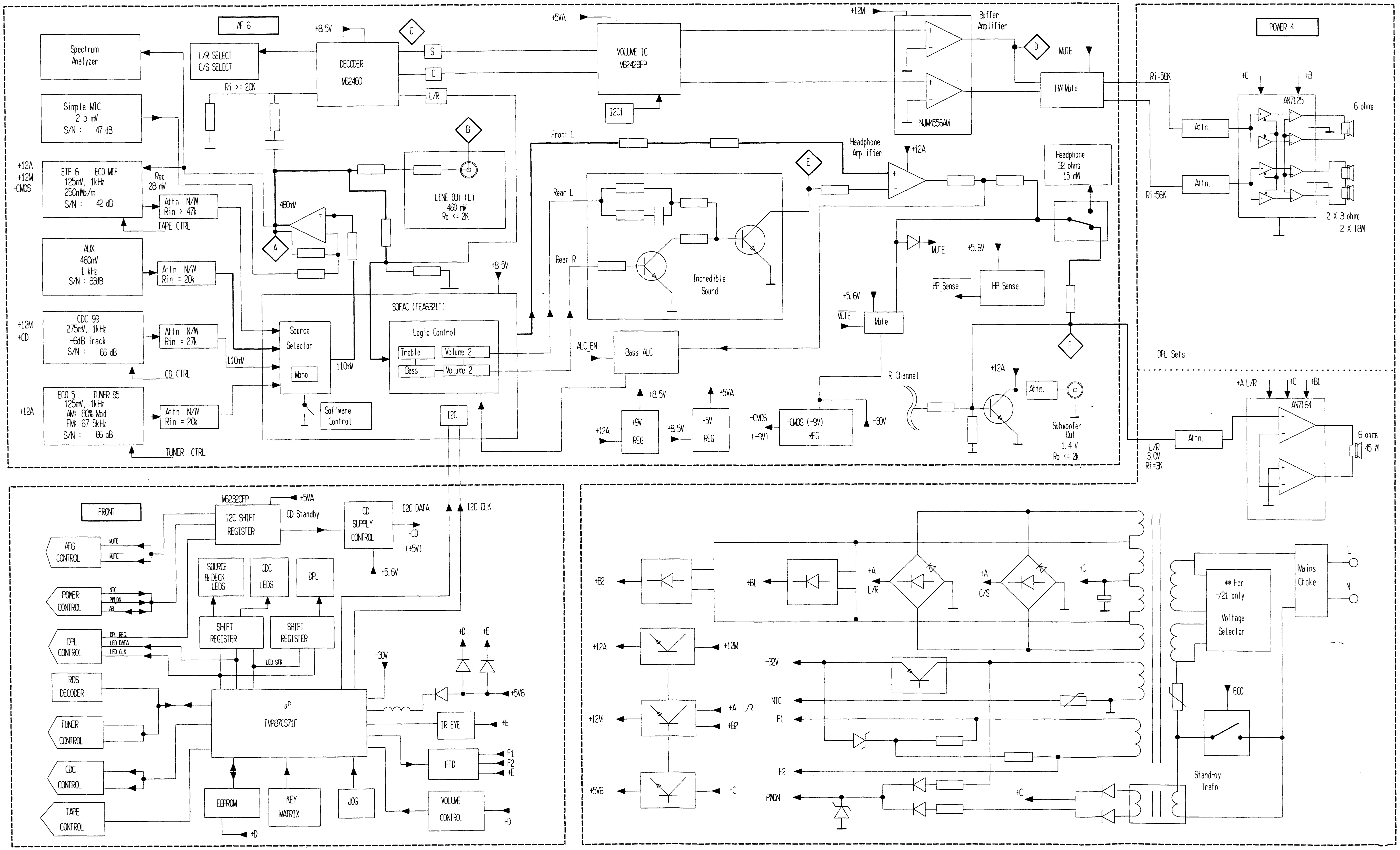
Figure 1


STEREO
BACK
VOCAL
JAZZ
CLASSIC
60Hz
500Hz
1KHz
4KHz
DBB

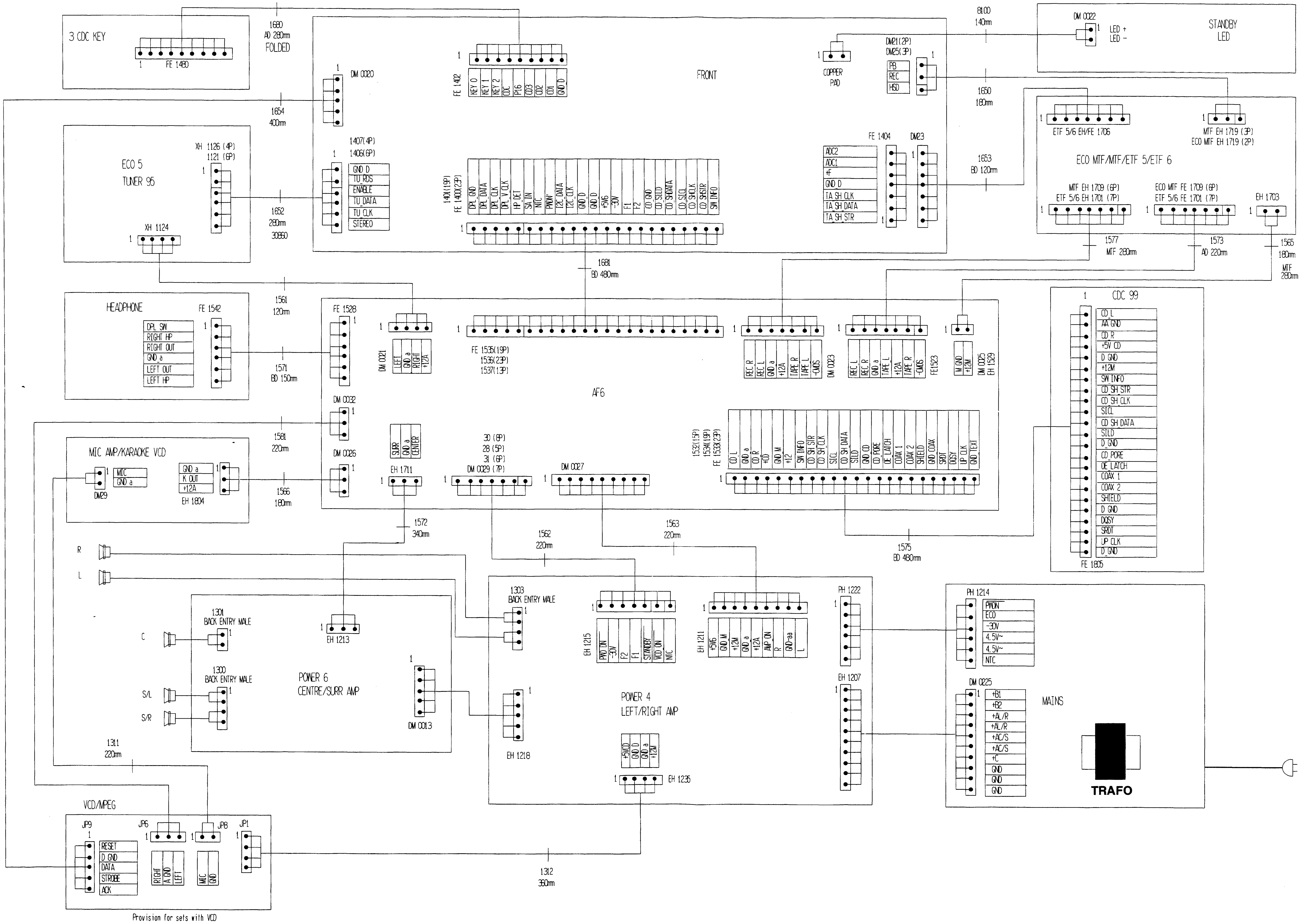
note1 : CDC1, CDC3, CD, Tape, Stereo Right, DPL Surround Left, DPL Centre Left.

Figure 2

SET BLOCK DIAGRAM


AF 6
Spectrum Analyzer
L/R SELECT
C/S SELECT
+8.5V
DECODER
M62460
Ri >= 20K
C
S
C
L/R
B
LINE OUT (L)
460 mV
Ro <= 2K
A
480mV
Simple MIC
2.5 mV
S/N : 47 dB
+12A
+12M
-CMOS
ETF 6 ECO MTF
125mV, 1kHz
250nWb/m
S/N : 42 dB
Rec
28 mV
Attn N/W
Rin > 47k
TAPE CTRL
AUX
460mV
1 kHz
S/N : 83dB
Attn N/W
Rin = 20k
+12M
+CD
CDC 99
275mV, 1kHz
-6dB Track
S/N : 66 dB
Attn N/W
Rin = 27k
CD CTRL
110mV
+12A
ECO 5 TUNER 95
125mV, 1kHz
AM: 80% Mod
FM: 67.5kHz
S/N : 66 dB
Attn N/W
Rin = 20k
TUNER CTRL
Source Selector
Mono
110mV
Software Control
SOFAC (TEA6321T)
Logic Control
Treble
Volume 2
Bass
Volume 2
+8.5V
I2C
+5VA
VOLUME IC
M62429FP
I2C1
Front L
Rear L
Rear R
Incredible Sound
E
ALC_EN
Bass ALC
+8.5V
+5VA
+12A
+9V REG
+8.5V
+5V REG
-CMOS (-9V)
-CMOS (-9V) REG
-30V
+12M
Buffer Amplifier
D
MUTE
NJM4556AM
HW Mute
Headphone Amplifier
+12A
Headphone
32 ohms
15 mW
MUTE
+5.6V
HP_Sense
HP Sense
+5.6V
MUTE
Mute
F
R Channel
+12A
Attn.
Subwoofer Out
1.4 V
Ro <= 2k
POWER 4
Ri=56K
+C
+B
AN7125
6 ohms
Attn.
Attn.
Ri=56K
2 X 3 ohms
2 X 18W
DPL Sets
+A L/R
+C
+B1
AN7164
Attn.
L/R
3.0V
Ri=3K
6 ohms
45 W
FRONT
M62320FP
+5VA
I2C SHIFT REGISTER
CD Standby
CD SUPPLY CONTROL
+CD
(+5V)
+5.6V
I2C DATA
I2C CLK
AF6 CONTROL
MUTE
MUTE
POWER CONTROL
NTC
PWDN
AB
DPL CONTROL
DPL REG
LED DATA
LED CLK
RDS DECODER
TUNER CONTROL
CDC CONTROL
TAPE CONTROL
SOURCE & DECK LEDS
CDC LEDS
DPL
SHIFT REGISTER
SHIFT REGISTER
LED STR
-30V
+D
+E
+5V6
uP
TMP87CS71F
IR EYE
+E
FTD
F1
F2
+E
EEPROM
+D
KEY MATRIX
JOG
VOLUME CONTROL
+D
+B2
+B1
+A L/R
+A C/S
+C
+12A
+12M
+12M
+A L/R
+B2
+5V6
+C
-32V
NTC
F1
F2
PWDN
+C
Mains Choke
L
N
** For -/21 only
Voltage Selector
ECO
Stand-by Trafo

SET WIRING DIAGRAM


3 CDC KEY
FE 1480
1680
AD 280mm
FOLDED
FRONT
DM 0020
FE 1402
KEY 0
KEY 1
KEY 2
CDC
PI6
CD3
CD2
CD1
GND D
1654
400mm
ECO 5
TUNER 95
XH 1126 (4P)
1121 (6P)
XH 1124
1652
280mm
30860
1407(4P)
1406(6P)
GND D
TU RDS
ENABLE
TU DATA
TU CLK
STEREO
1401(19P)
1400(23P)
DPL GND
DPL DATA
DPL CLK
DPL V CLK
HP DET
SA IN
NTC
PWON
I2C DATA
I2C CLK
GND D
GND D
+5V6
-30V
F1
F2
CD GND
CD SILD
CD SHDATA
CD SICL
CD SHCLK
CD SHSTR
SW INFO
COPPER PAD
DM21(2P)
DM25(3P)
PB
REC
HSD
FE 1404
DM23
ADC2
ADC1
+f
GND D
TA SH CLK
TA SH DATA
TA SH STR
8100
140mm
1650
180mm
1653
BD 120mm
DM 0022
LED +
LED -
STANDBY LED
ETF 5/6 EH/FE 1706
MTF EH 1719 (3P)
ECO MTF EH 1719 (2P)
ECO MTF/MTF/ETF 5/ETF 6
MTF EH 1709 (6P)
ETF 5/6 EH 1701 (7P)
ECO MTF FE 1709 (6P)
ETF 5/6 FE 1701 (7P)
EH 1703
1577
MTF 280mm
1573
AD 220mm
1565
180mm
MTF
280mm
1681
BD 480mm
HEADPHONE
FE 1542
DPL SW
RIGHT HP
RIGHT OUT
GND a
LEFT OUT
LEFT HP
1561
120mm
1571
BD 150mm
FE 1528
DM 0021
LEFT
GND a
RIGHT
+12A
FE 1535(19P)
1536(23P)
1537(13P)
AF6
REC R
REC L
GND a
+12A
TAPE R
TAPE L
-CMOS
DM 0023
REC L
REC R
GND a
TAPE L
+12A
TAPE R
-CMOS
FE1523
M GND
+12M
DM 0025
EH 1529
CDC 99
CD L
AA GND
CD R
+5V CD
D GND
+12M
SW INFO
CD SH STR
CD SH CLK
SICL
CD SH DATA
SILD
D GND
CD PORE
OE LATCH
COAX 1
COAX 2
SHIELD
D GND
DOSY
SRDT
UP CLK
D GND
FE 1805
DM 0032
1581
220mm
MIC AMP/KARAOKE VCD
MIC
GND a
DM29
GND a
K OUT
+12A
EH 1804
1566
180mm
DM 0026
SURR
GND a
CENTER
EH 1711
30 (6P)
28 (5P)
31 (6P)
DM 0029 (7P)
DM 0027
1532(15P)
1534(19P)
FE 1533(23P)
CD L
GND a
CD R
+CD
GND M
+12
SW INFO
CD SH STR
CD SH CLK
SICL
CD SH DATA
SILD
GND CD
CD PORE
OE LATCH
COAX 1
COAX 2
SHIELD
GND COAX
SRDT
DOSY
UP CLK
GND TEXT
1572
340mm
1562
220mm
1563
220mm
1575
BD 480mm
R
L
C
S/L
S/R
1301
BACK ENTRY MALE
1300
BACK ENTRY MALE
EH 1213
POWER 6
CENTRE/SURR AMP
DM 0013
1303
BACK ENTRY MALE
EH 1215
PWD ON
-30V
F2
F1
STANDBY
VCD ON
NTC
EH 1211
+5V6
GND M
+12M
GND a
+12A
AMP ON
R
GND-aa
L
PH 1222
EH 1207
EH 1218
POWER 4
LEFT/RIGHT AMP
+5VCD
GND D
GND a
+12M
EH 1235
PH 1214
PWON
ECO
-30V
4.5V~
4.5V~
NTC
DM 0225
+B1
+B2
+AL/R
+AL/R
+AC/S
+AC/S
+C
GND
GND
GND
MAINS
TRAFO
1311
220mm
VCD/MPEG
JP9
JP6
JP8
JP1
RESET
D GND
DATA
STROBE
ACK
RIGHT
A GND
LEFT
MIC
GND
1312
360mm
Provision for sets with VCD

FRONT BOARD

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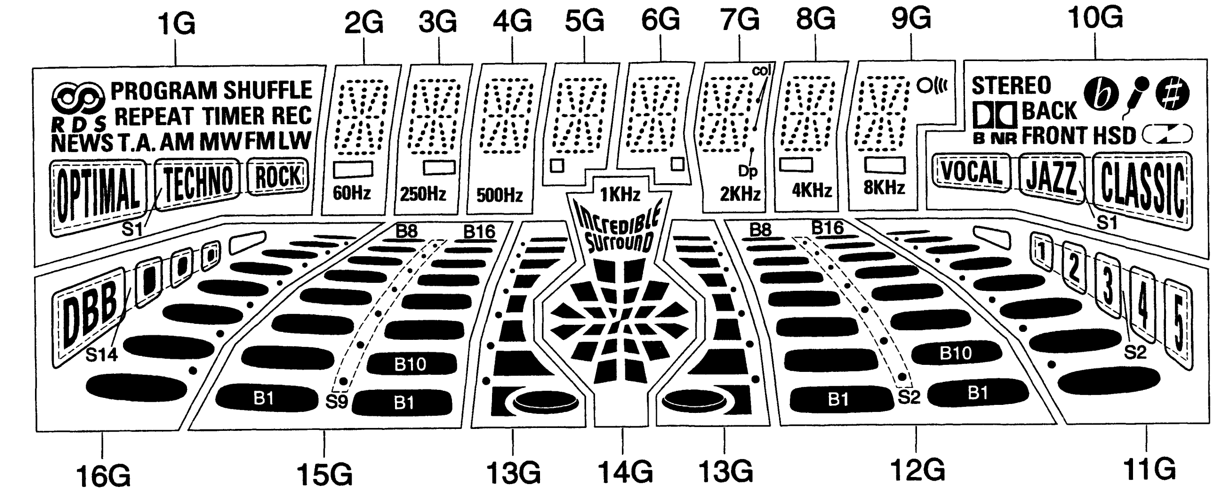
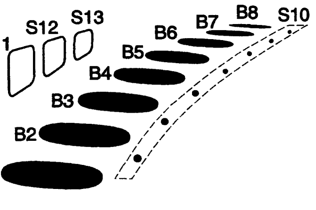
FTD DISPLAY PIN CONNECTIONS

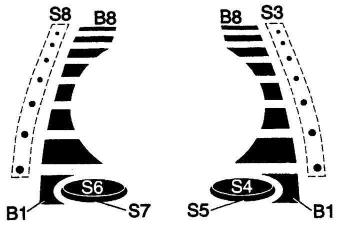


1G
2G
3G
4G
5G
6G
7G
8G
9G
10G
PROGRAM SHUFFLE
RDS REPEAT TIMER REC
NEWS T.A. AM MW FM LW
OPTIMAL
TECHNO
ROCK
S1
60Hz
250Hz
500Hz
1KHz
col
Dp
2KHz
4KHz
8KHz
STEREO
BACK
B NR FRONT HSD
VOCAL
JAZZ
CLASSIC
S1
INCREDIBLE SURROUND
B8
B16
B8
B16
DBB
S14
1
2
3
4
5
S2
B10
B1
S9
B1
B10
B1
S2
B1
16G
15G
13G
14G
13G
12G
11G



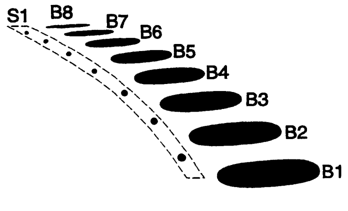
S11
S12
S13
B6
B7
B8
S10
B5
B4
B3
B2
B1

(16G)



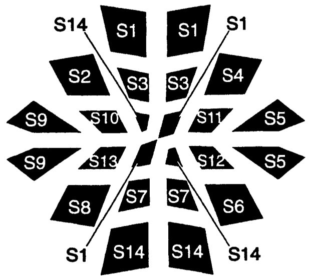
S8
B8
B8
S3
S6
S4
B1
S7
S5
B1

(13G)



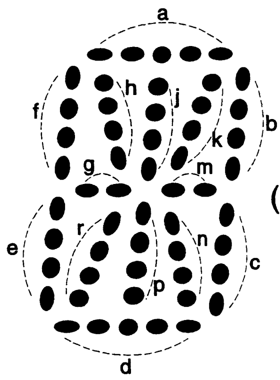
S1
B8
B7
B6
B5
B4
B3
B2
B1

(11G)



S14
S1
S1
S1
S2
S3
S3
S4
S9
S10
S11
S5
S9
S13
S12
S5
S8
S7
S7
S6
S1
S14
S14
S14

(14G)



a
h
j
f
b
k
g
m
r
e
n
c
p
d

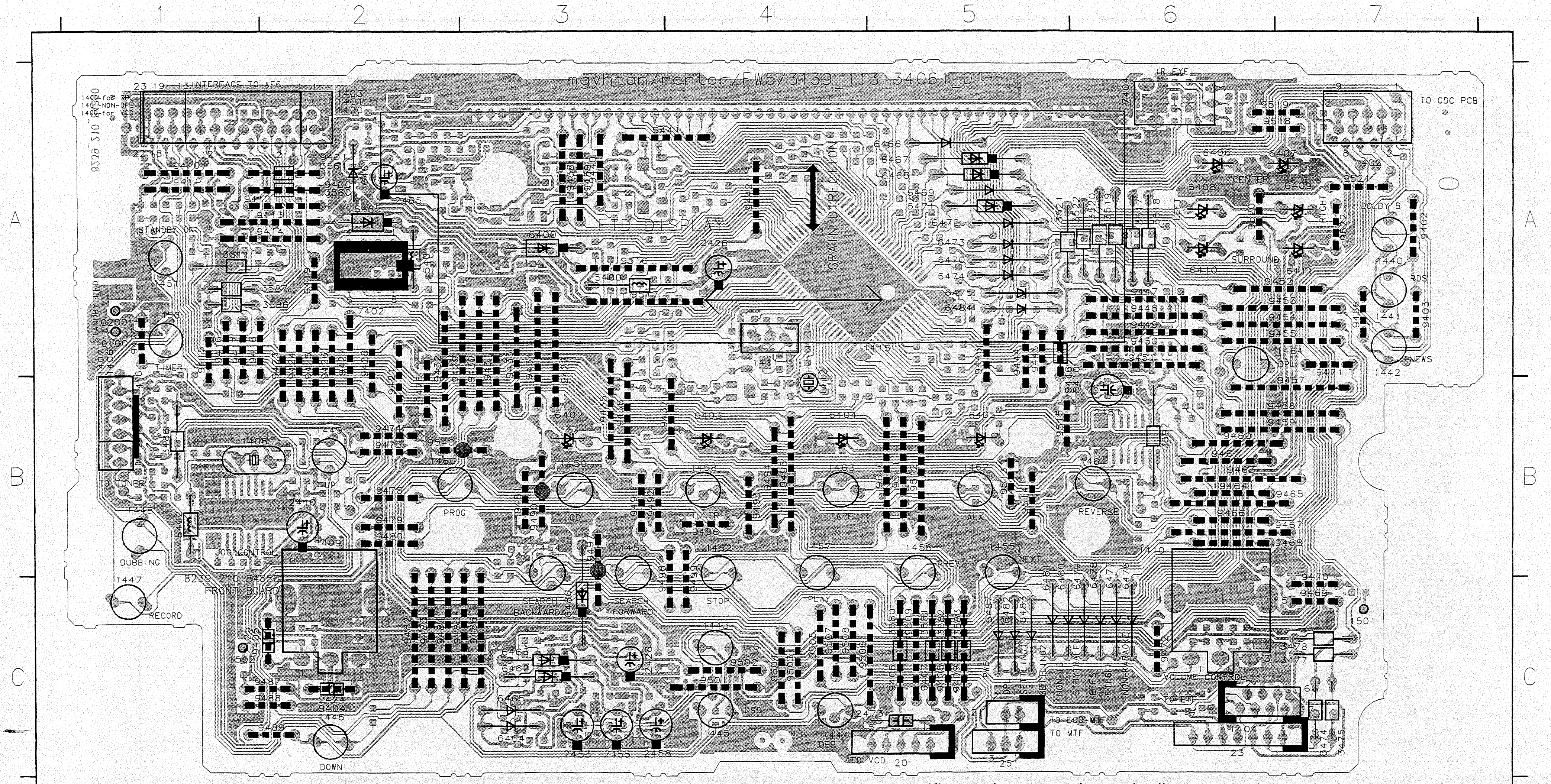
(2G-9G)

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	15G	16G
P1	RDS	a	a	a	a	a	a	a	a	STEREO	B1	B1	B1	S1	B1	B1
P2	NEWS	h	h	h	h	h	h	h	h	B NR	B2	B2	B2	S2	B2	B2
P3	T.A.	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	BACK	B3	B3	B3	S3	B3	B3
P4	PROGRAM	k	k	k	k	k	k	k	k	FRONT	B4	B4	B4	S4	B4	B4
P5	SHUFFLE	b	b	b	b	b	b	b	b	b	B5	B5	B5	S5	B5	B5
P6	REPEAT	f	f	f	f	f	f	f	f	🎤	B6	B6	B6	S6	B6	B6
P7	TIMER	m	m	m	m	m	m	m	m	#	B7	B7	B7	S7	B7	B7
P8	REC	g	g	g	g	g	g	g	g	HSD	B8	B8	B8	S8	B8	B8
P9	AM	c	c	c	c	c	c	c	c	Z	S1	S2	S3	S9	S9	S10
P10	MW	e	e	e	e	e	e	e	e	(	▱	B10	S8	S10	B10	▱
P11	FM	r	r	r	r	r	r	r	r	)	S2	B11	-	S11	B11	-
P12	LW	n	n	n	n	n	n	n	n	-	▯ (1)	B12	-	S12	B12	▱ (DBB)
P13	S1	d	d	d	d	d	d	d	d	S1	▯ (2)	B13	S7	S13	B13	S14
P14	▭ (OPTIMAL)	▭	▭	-	☐	☐	col	▭	▭	(VOCAL) ▭	▯ (3)	B14	S6	S14	B14	S11
P15	▭ (TECHNO)	60Hz	250Hz	500Hz	-	-	2KHz	4KHz	8KHz	(JAZZ) ▭	▯ (4)	B15	S4	1KHz	B15	S12
P16	▭ (ROCK)	-	-	-	-	-	Dp	-	O(((	(CLASSIC) ▭	▯ (5)	B16	S5	INCREDIBLE SURROUND	B16	S13

NOTE :

FRONT BOARD - COMPONENT LAYOUT

20	C5	1408	B1	1447	C1	1460	B2	2455	C3	3519	A6	5400	A3	6410	A6	6472	A5	6485	A2	9408	C5	9422	A3	9435	B3	9448	A6	9461	B6	9476	B2	9489	C2	9503	C4	9516	A3
21	C5	1409	B2	1448	B1	1461	B6	2458	C3	3520	A6	5401	A2	6411	A7	6473	A5	6486	C3	9409	C5	9423	A2	9436	B3	9449	A6	9463	B6	9477	A1	9490	B3	9504	C4	9517	A3
23	C6	1410	B6	1449	B2	1462	B5	2465	A2	3521	A5	5402	B1	6461	A2	6474	A5	6487	C5	9410	A1	9424	A2	9437	B3	9450	A6	9464	B6	9478	B2	9491	B3	9505	C4	9518	A7
25	C5	1411	A4	1450	A1	1463	B4	2473	C5	3522	A6	5410	B6	6462	C3	6475	A5	7402	A2	9411	A1	9425	A2	9438	A3	9451	A6	9465	B7	9479	B2	9492	B3	9506	C4	9519	A7
0100	A1	1412	B4	1451	A1	1464	A7	2481	B6	3560	A2	6400	A3	6463	C3	6476	C6	7404	A6	9412	A1	9426	A2	9439	A3	9452	A7	9466	B6	9480	B2	9493	B4	9507	C4	9520	A6
0200	A1	1415	A5	1452	B4	1501	C7	3474	C7	3561	A2	6402	B3	6464	C3	6477	C6	9400	A2	9413	A2	9427	A2	9440	A3	9453	A7	9467	B7	9481	B3	9494	B4	9508	C4	9521	A7
1400	A2	1440	A7	1453	B3	1502	C1	3475	C7	3580	C5	6403	B4	6465	C3	6478	C6	9401	A2	9414	A2	9428	A2	9441	A4	9454	A7	9468	B7	9482	C2	9495	B4	9509	C5	9522	A7
1401	A2	1441	A7	1454	B3	2410	B2	3477	C7	3581	C5	6404	B4	6466	A5	6479	C6	9402	A7	9415	A1	9429	A2	9442	A4	9455	A7	9469	C7	9483	C2	9496	B4	9510	B5	9540	B2
1402	A7	1442	A7	1455	B5	2424	C2	3478	C7	3582	C5	6405	B5	6467	A5	6480	C5	9403	A7	9416	A1	9430	A3	9443	A5	9456	A7	9470	C7	9484	C2	9497	B3	9511	B5		
1403	A2	1443	C4	1456	B5	2425	C1	3486	B1	3583	C5	6406	A6	6468	A5	6481	C5	9404	C2	9417	A1	9431	A3	9444	A5	9457	B7	9471	A7	9485	C2	9498	C3	9512	B5		
1404	C6	1444	C4	1457	B4	2426	A4	3511	A1	3586	A2	6407	A7	6469	A5	6482	C5	9405	C1	9418	A1	9432	A2	9445	A5	9458	B7	9472	C6	9486	C3	9499	C4	9513	B5		
1406	A1	1445	C4	1458	B4	2428	C3	3517	A6	3587	A2	6408	A6	6470	A5	6483	C5	9406	C5	9419	A2	9433	A3	9446	B5	9459	B7	9474	B2	9487	C2	9501	C4	9514	B5		
1407	A1	1446	C2	1459	B3	2453	C3	3518	A6	3592	B6	6409	A7	6471	A5	6484	A5	9407	C5	9421	B2	9434	A3	9447	A6	9460	B6	9475	B2	9488	C2	9502	C4	9515	B5		

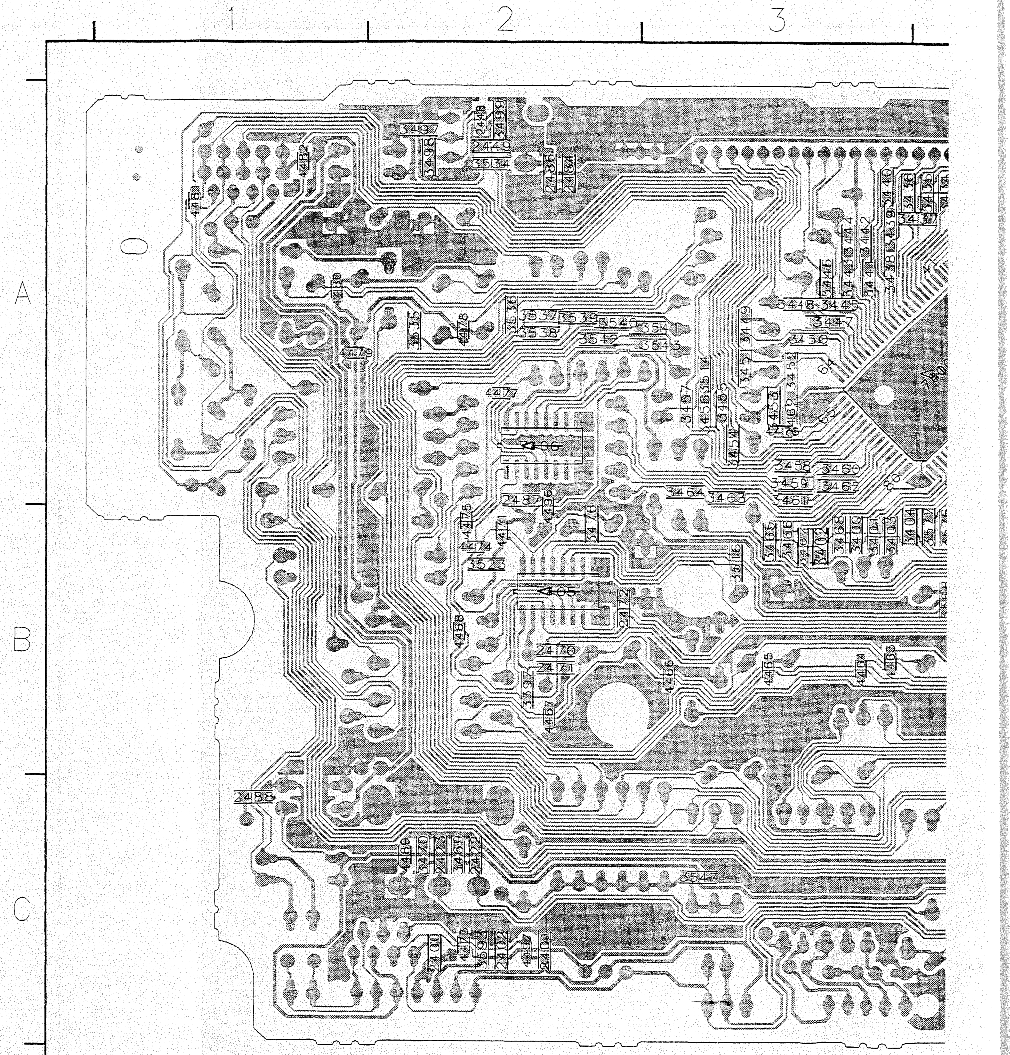


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

● - Solder pad on the component side are for grounding purpose (For double-sided pc board only).

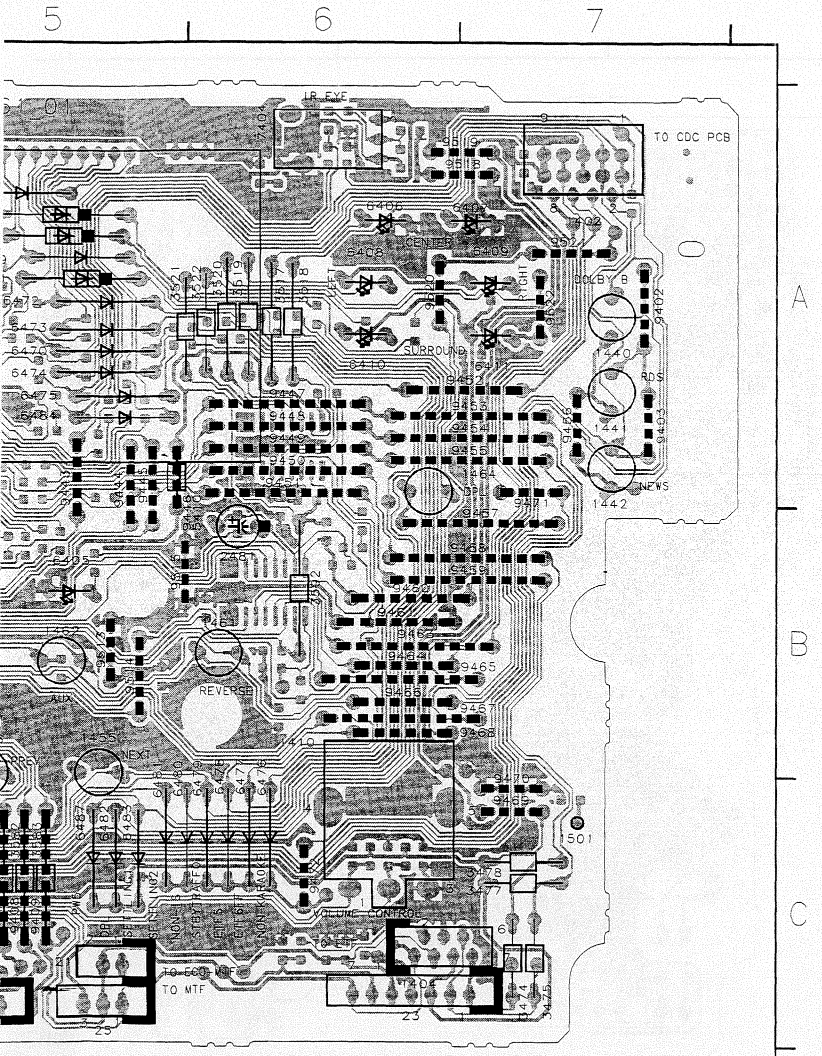
FRONT BOARD - CHIP LAYOUT

2400	C2	2417	B4	2440	A5	2462	A3	3400	B3	3416	A5	3432	A4	3448	A3	3464	
2401	C2	2418	A4	2441	A6	2463	A7	3401	B3	3417	A5	3433	A4	3449	A3	3465	
2402	C2	2419	A4	2442	A6	2464	B7	3402	B3	3418	A5	3434	A4	3450	A3	3466	
2403	B7	2420	A4	2445	A6	2470	B2	3403	B3	3419	A5	3435	A4	3451	A3	3467	
2404	B7	2421	A4	2446	B7	2471	B2	3404	B3	3420	A5	3436	A3	3452	A3	3468	
2405	B7	2422	C2	2447	B7	2472	B2	3405	A4	3421	A5	3437	A4	3453	A3	3469	
2406	B7	2423	C2	2448	A2	2475	A7	3406	A5	3422	A5	3438	A3	3454	A3	3470	
2407	B7	2431	A5	2449	A2	2482	B4	3407	A5	3423	A4	3439	A3	3455	A3	3471	
2408	B7	2432	A5	2450	B4	2483	A6	3408	A5	3424	A4	3440	A3	3456	A3	3472	
2409	B7	2433	A4	2451	B5	2484	A2	3409	A5	3425	A4	3441	A3	3457	A3	3473	
2411	B7	2434	A5	2452	B4	2485	A6	3410	A5	3426	A4	3442	A3	3458	A3	3476	
2412	A7	2435	A5	2454	C5	2486	A2	3411	A5	3427	A4	3443	A3	3459	A3	3479	
2413	A7	2436	A5	2456	C5	2487	A2	3412	A5	3428	A4	3444	A3	3460	A3	3480	
2414	A7	2437	A5	2457	C5	2488	C1	3413	A4	3429	A4	3445	A3	3461	A3	3481	
2415	A7	2438	A5	2459	C5	2489	C7	3414	A4	3430	A4	3446	A3	3462	A3	3482	
2416	A7	2439	A5	2460	C5	3397	B2	3415	A5	3431	A4	3447	A3	3463	A3	3483	



This assembly drawing shows a summary of all possible versions. For

A3	9435	B3	9448	A6	9461	B6	9476	B2	9489	C2	9503	C4	9516	A3
A2	9436	B3	9449	A6	9463	B6	9477	A1	9490	B3	9504	C4	9517	A3
A2	9437	B3	9450	A6	9464	B6	9478	B2	9491	B3	9505	C4	9518	A7
A2	9438	A3	9451	A6	9465	B7	9479	B2	9492	B3	9506	C4	9519	A7
A2	9439	A3	9452	A7	9466	B6	9480	B2	9493	B4	9507	C4	9520	A6
A2	9440	A3	9453	A7	9467	B7	9481	B3	9494	B4	9508	C4	9521	A7
A2	9441	A4	9454	A7	9468	B7	9482	C2	9495	B4	9509	C5	9522	A7
A2	9442	A4	9455	A7	9469	C7	9483	C2	9496	B4	9510	B5	9540	B2
A3	9443	A5	9456	A7	9470	C7	9484	C2	9497	B3	9511	B5		
A3	9444	A5	9457	B7	9471	A7	9485	C2	9498	C3	9512	B5		
A2	9445	A5	9458	B7	9472	C6	9486	C3	9499	C4	9513	B5		
A3	9446	B5	9459	B7	9474	B2	9487	C2	9501	C4	9514	B5		
A3	9447	A6	9460	B6	9475	B2	9488	C2	9502	C4	9515	B5		

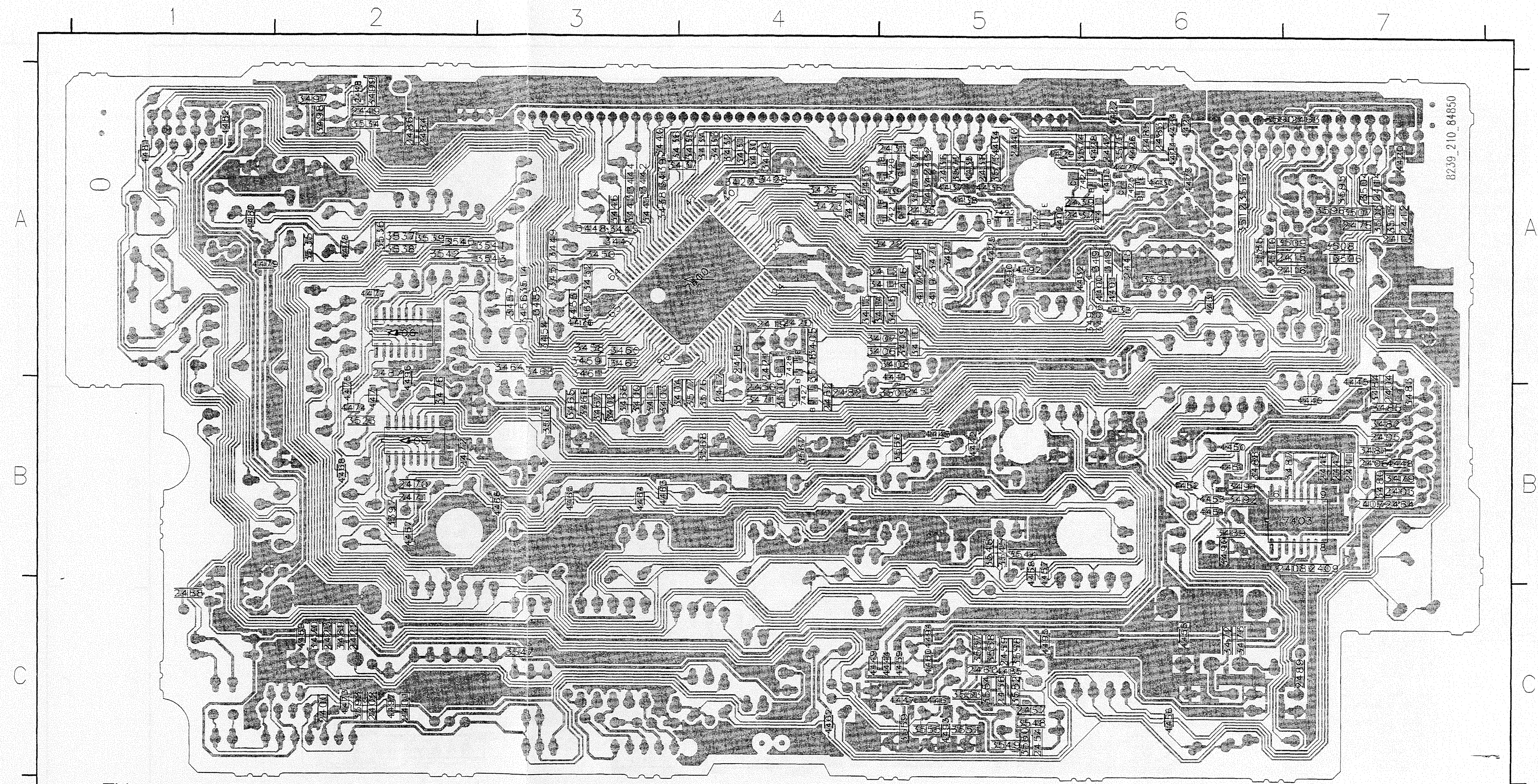


ific version see schematic diagram and respective parts list.

FRONT BOARD - CHIP LAYOUT

2400	C2	2417	B4	2440	A5	2462	A3	3400	B3	3416	A5	3432	A4	3448	A3	3464	A3
2401	C2	2418	A4	2441	A6	2463	A7	3401	B3	3417	A5	3433	A4	3449	A3	3465	B3
2402	C2	2419	A4	2442	A6	2464	B7	3402	B3	3418	A5	3434	A4	3450	A3	3466	B3
2403	B7	2420	A4	2445	A6	2470	B2	3403	B3	3419	A5	3435	A4	3451	A3	3467	B3
2404	B7	2421	A4	2446	B7	2471	B2	3404	B3	3420	A5	3436	A3	3452	A3	3468	B3
2405	B7	2422	C2	2447	B7	2472	B2	3405	A4	3421	A5	3437	A4	3453	A3	3469	C2
2406	B7	2423	C2	2448	A2	2475	A7	3406	A5	3422	A5	3438	A3	3454	A3	3470	C2
2407	B7	2431	A5	2449	A2	2482	B4	3407	A5	3423	A4	3439	A3	3455	A3	3471	B4
2408	B7	2432	A5	2450	B4	2483	A6	3408	A5	3424	A4	3440	A3	3456	A3	3472	C6
2409	B7	2433	A4	2451	B5	2484	A2	3409	A5	3425	A4	3441	A3	3457	A3	3473	C6
2411	B7	2434	A5	2452	B4	2485	A6	3410	A5	3426	A4	3442	A3	3458	A3	3476	B2
2412	A7	2435	A5	2454	C5	2486	A2	3411	A5	3427	A4	3443	A3	3459	A3	3479	B7
2413	A7	2436	A5	2456	C5	2487	A2	3412	A5	3428	A4	3444	A3	3460	A3	3480	B7
2414	A7	2437	A5	2457	C5	2488	C1	3413	A4	3429	A4	3445	A3	3461	A3	3481	B7
2415	A7	2438	A5	2459	C5	2489	C7	3414	A4	3430	A4	3446	A3	3462	A3	3482	B7
2416	A7	2439	A5	2460	C5	3397	B2	3415	A5	3431	A4	3447	A3	3463	A3	3483	B7

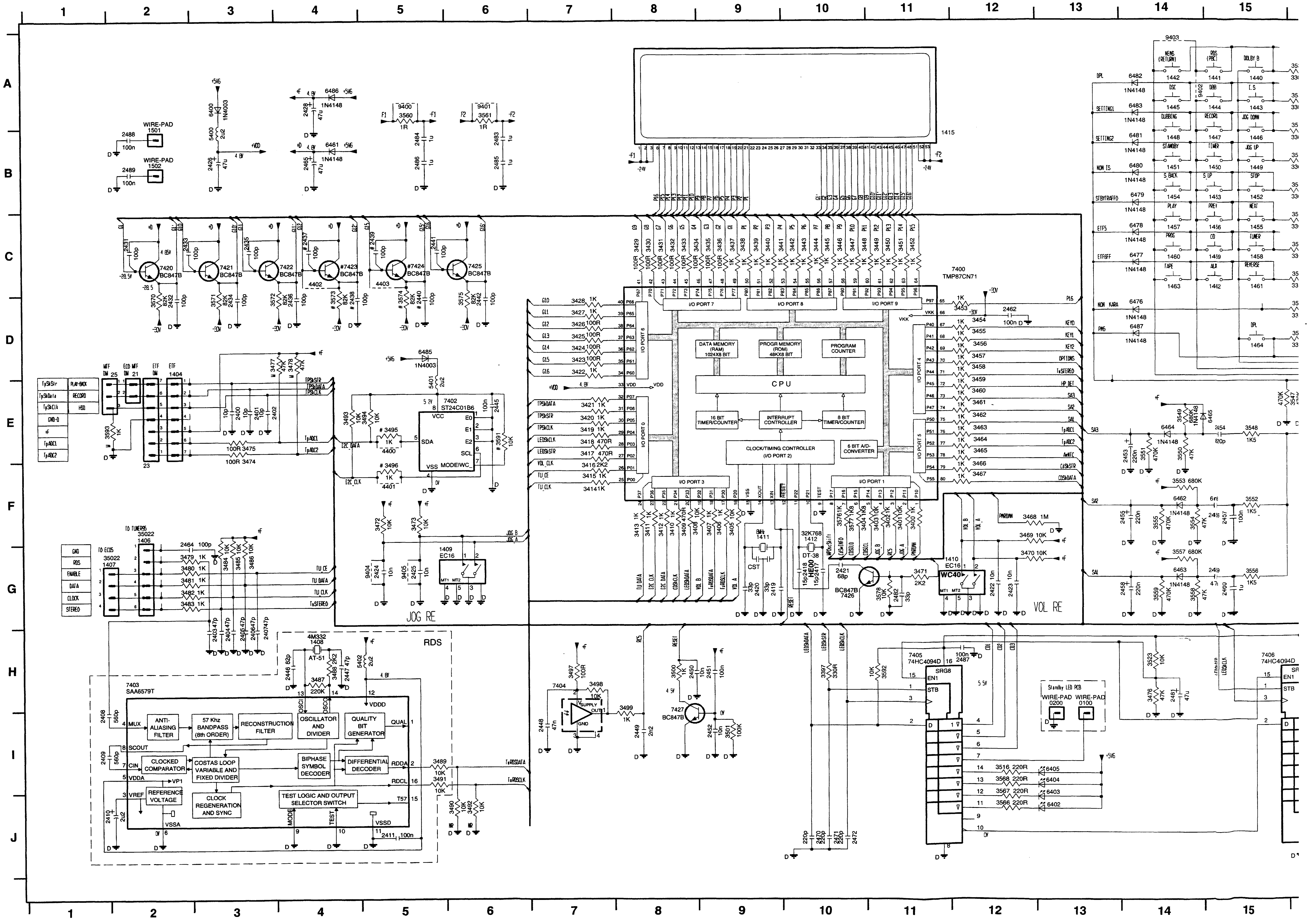
3484	B7	3501	B5	3536	A2	3552	C5	3575	A6	4422	A6	4438	A5	4454	B6	4471	B2	4494	C5
3485	B7	3503	A7	3537	A2	3553	C5	3576	B4	4423	A6	4439	A5	4455	C6	4473	C2	4495	C5
3487	B7	3504	A7	3538	A2	3554	C5	3577	B4	4424	A6	4440	A5	4456	C6	4474	B2	4496	B2
3488	B6	3505	A7	3539	A2	3555	C5	3578	A4	4425	A5	4441	A5	4457	B5	4475	B2	4497	C2
3489	B6	3506	A7	3540	A2	3556	C5	3585	A6	4426	A6	4442	B5	4458	B5	4476	A3	7400	A4
3490	B6	3507	A7	3541	A3	3557	C5	3590	A6	4427	A6	4443	B5	4459	C5	4477	A2	7403	B7
3491	B6	3508	A7	3542	A2	3558	C5	3591	A6	4428	A6	4444	C5	4460	C5	4478	A2	7405	B2
3492	B6	3509	A7	3543	A3	3559	C5	3593	C2	4429	A5	4445	A7	4461	C5	4479	A1	7406	A2
3493	A6	3510	A6	3544	B5	3566	B5	3595	A7	4430	A6	4446	B7	4462	C4	4480	A1	7420	A5
3494	A6	3512	A6	3545	B5	3567	B4	3596	A7	4431	A6	4447	C5	4463	B3	4481	A1	7421	A5
3495	A6	3513	A6	3546	B5	3568	B4	4400	A6	4432	A5	4448	B7	4464	B3	4482	A1	7422	A5
3496	A6	3514	A3	3547	C3	3570	A5	4401	A6	4433	A6	4449	C4	4465	B3	4484	A6	7423	A5
3497	A2	3516	B3	3548	C5	3571	A5	4402	A5	4434	A5	4450	B6	4466	B3	4485	C5	7424	A6
3498	A2	3523	B2	3549	C5	3572	A5	4403	A6	4435	A5	4451	B6	4467	B2	4490	A5	7425	A6
3499	A2	3534	A2	3550	C5	3573	A5	4420	A7	4436	A5	4452	B6	4468	B2	4492	A5	7426	A4
3500	B4	3535	A2	3551	C5	3574	A6	4421	A6	4437	A5	4453	B6	4469	C2	4493	C5	7427	B4



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CIRCUIT DIAGRAM

20	A21
21	D2
23	F2
25	D2
0100	H13
0200	H13
1400	D19
1401	D19
1402	G20
1403	D19
1404	D2
1406	F2
1407	G1
1408	H4
1409	G5
1410	G11
1411	F9
1412	F10
1415	B11
1440	A15
1441	A15
1442	A14
1443	A15
1444	A15
1445	A14
1446	B15
1447	B15
1448	B14
1449	B15
1450	B15
1451	B14
1452	B15
1453	B15
1454	B14
1455	C15
1456	C15
1457	C14
1458	C15
1459	C15
1460	C14
1461	C15
1462	C15
1463	C14
1464	D15
1501	B2
1502	B2
2400	E3
2401	E3
2402	E3
2403	H3
2404	H3
2405	H3
2406	H3
2407	H3
2408	I1
2409	I1
2410	J1
2411	J5
2412	B17
2413	B18
2414	B18
2415	C17
2416	C18
2417	G10
2418	G10
2419	G9
2420	G9
2421	G10
2422	G12
2423	G12
2424	G5
2425	G5
2426	B3
2428	A4
2431	C2
2432	D2
2433	C2
2434	D3
2435	C3
2436	D4
2437	C4
2438	D4
2439	C5
2440	D5
2441	C5
2442	D6
2445	E6
2446	H4
2447	H4
2448	I7
2449	I8
2450	H8
2451	H9
2452	I9
2453	E14
2454	E15
2455	F14
2456	F15
2457	F15
2458	G14
2459	G15
2460	G15
2462	D12
2463	B18
2464	G2
2465	B4
2470	J10
2471	J10
2472	J10
2473	A21
2475	B17
2481	H14
2482	G11
2483	B6
2484	B5
2485	B6
2486	B5
2487	H12
2488	B2
2489	B2
3397	H10
3400	F11
3401	F11
3402	F11
3403	F11
3404	F10
3405	F9
3406	F9
3407	F9
3408	F8
3409	F8
3410	F8
3411	F8
3412	F8
3413	F8
3414	F7
3415	F7
3416	F7
3417	E7
3418	E7
3419	E7
3420	E7
3421	E7
3422	D7
3423	D7
3424	D7
3425	D7
3426	D7
3427	D7
3428	D7
3429	C8
3430	C8
3431	C8
3432	C8
3433	C8
3434	C9
3435	C9
3436	C9
3437	C9
3438	C9
3439	C9
3440	C9
3441	C10
3442	C10
3443	C10
3444	C10
3445	C10
3446	C10
3447	C10
3448	C11
3449	C11
3450	C11
3451	C11
3452	C11
3453	D12
3454	D12
3455	D12
3456	D12
3457	D12
3458	D12
3459	E12
3460	E12
3461	E12
3462	E12
3463	E12
3464	E12
3465	E12
3466	F12
3467	F12
3468	F12
3469	F12
3470	G12
3471	G11
3472	F5
3473	F5
3474	F3
3475	E3
3476	H14
3477	D3
3478	D4
3479	G2
3480	G2
3481	G2
3482	G2
3483	G2
3484	G3
3485	G3
3486	G3
3487	H4
3488	H4
3489	I5
3490	J6
3491	I5
3492	J6
3493	E4
3494	E5
3495	E5
3496	F5
3497	H7
3498	H7
3499	H8
3500	H8
3501	I9
3503	A18
3504	A18
3505	A18
3506	B17
3507	B18
3508	B17
3509	C18
3510	C18
3511	C17
3512	D18
3513	D18
3514	G20
3516	I12
3517	I16
3518	I16
3519	I17
3520	I17
3521	J17
3522	I17
3523	H14
3534	A16
3535	A16
3536	A16
3537	B16
3538	B16
3539	C16
3540	C16
3541	C16
3542	D16
3543	D16
3544	E16
3545	E16
3546	E16
3547	E16
3548	E15
3549	E14
3550	E14
3551	E14
3552	F15
3553	F14
3554	F14
3555	F14
3556	G15
3557	G14
3558	G14
3559	G14
3560	A5
3561	A6
3566	J12
3567	I12
3568	I12
3570	D2
3571	D3
3572	D4
3573	D4
3574	D5
3575	D6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A
B
C
D
E
F
G
H
I
J
WIRE-PAD
1501
1502
2488
2489
100n
1N4003
1N4148
9400
9401
3560
3561
1R
1415
7400
TMP87CN71
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 4
I/O PORT 0
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
7420
7421
7422
7423
7424
7425
BC847B
7402
ST24C01B6
VCC
SDA
SCL
VSS
MODE/WC
E0
E1
E2
1409
EC16
JOG RE
1410
EC16
WC40
VOL RE
1411
CST
1412
DT-38
HE00
7426
7427
7404
SUPPLY
OUT
GND
7403
SAA6579T
RDS
1408
4M332
AT-51
MUX
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
QUAL
SCOUT
CIN
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
RDDA
RDCL
VDDA
VREF
REFERENCE VOLTAGE
VP1
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
T57
MODE
TEST
VSSA
VSSD
VDDD
OSCI
OSCO
TO TUNER95
35022
1406
TO ECO5
1407
GND
RDS
ENABLE
DATA
CLOCK
STEREO
TU CE
TU DATA
TU CLK
TuSTEREO
MTF
ECO MTF
ETF
1404
PLAY-BACK
RECORD
HSD
7405
74HC4094D
SRG8
EN1
STB
7406
74HC4094D
Standby LED PCB
WIRE-PAD
0200
0100
6405
6404
6403
6402
9403
NEWS (RETURN)
RDS (PBC)
DOLBY B
DSC
DBB
DUBBING
RECORD
JOG DOWN
STANDBY
TIMER
JOG UP
S BACK
S UP
STOP
PLAY
PREV
NEXT
PROG
CD
TUNER
TAPE
AUX
REVERSE
DPL
1442
1441
1440
1445
1444
1443
1448
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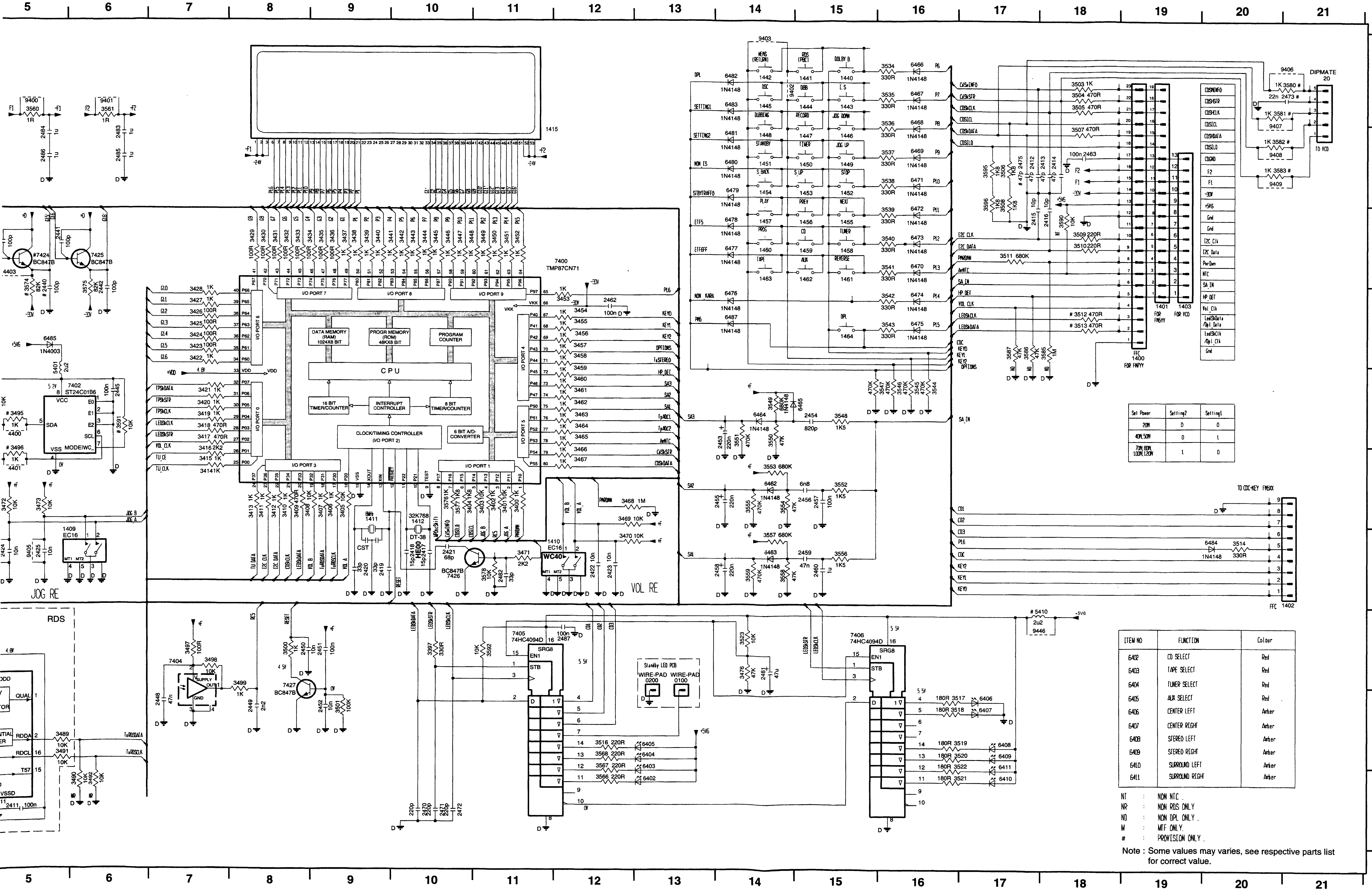
1458
1463
1462
1461
1464
9402
6482
6483
6481
6480
6479
6478
6477
6476
6487
6464
6462
6463
SETTING1
SETTING2
NON TS
ETFS
ETFFF
NON KARA
PNS
SA3
SA2
SA1
KEY0
KEY1
KEY2
OPTIONS
TuSTEREO
HP_DET
PWRDWN
RESET
3468 1M
3469 10K
3470 10K

2437 C4	2447 H4	2455 F14	2464 G2	2482 G11	3397 H10	3407 F9	3415 F7	3423 D7	3431 C8	3439 C9	3447 C10	3455 D12	3463 E12	3471 G11	3479 G2	3487 H4	3495 E5
2438 D4	2448 I7	2456 F15	2465 B4	2483 B6	3400 F11	3408 F8	3416 F7	3424 D7	3432 C8	3440 C9	3448 C11	3456 D12	3464 E12	3472 F5	3480 G2	3488 H4	3496 F5
2439 C5	2449 I8	2457 F15	2470 J10	2484 B5	3401 F11	3409 F8	3417 E7	3425 D7	3433 C8	3441 C10	3449 C11	3457 D12	3465 E12	3473 F5	3481 G2	3489 I5	3497 H7
2440 D5	2450 H8	2458 G14	2471 J10	2485 B6	3402 F11	3410 F8	3418 E7	3426 D7	3434 C9	3442 C10	3450 C11	3458 D12	3466 F12	3474 F3	3482 G2	3490 J6	3498 H7
2441 C5	2451 H9	2459 G15	2472 J10	2486 B5	3403 F11	3411 F8	3419 E7	3427 D7	3435 C9	3443 C10	3451 C11	3459 E12	3467 F12	3475 E3	3483 G2	3491 I5	3499 H8
2442 D6	2452 I9	2460 G15	2473 A21	2487 H12	3404 F10	3412 F8	3420 E7	3428 D7	3436 C9	3444 C10	3452 C11	3460 E12	3468 F12	3476 H14	3484 G3	3492 J6	3500 H8
2445 E6	2453 E14	2462 D12	2475 B17	2488 B2	3405 F9	3413 F8	3421 E7	3429 C8	3437 C9	3445 C10	3453 D12	3461 E12	3469 F12	3477 D3	3485 G3	3493 E4	3501 I9
2446 H4	2454 E15	2463 B18	2481 H14	2489 B2	3406 F9	3414 F7	3422 D7	3430 C8	3438 C9	3446 C10	3454 D12	3462 E12	3470 G12	3478 D4	3486 G3	3494 E5	3503 A18

3504 A18	3512 D18	3521 J17	3539 C16	3547 E16	3555 F14	3567 I12	3576 F10	3586 D17	4400 E5	6400 A3	6409 I17	6466 A16	6474 D16	6482 A14	7403 H2	7424 C5	9404 G5
3505 A18	3513 D18	3522 I17	3540 C16	3548 E15	3556 G15	3568 I12	3577 F10	3587 D17	4401 F5	6402 J13	6410 J17	6467 A16	6475 D16	6483 A14	7404 H7	7425 C6	9405 G5
3506 B17	3514 G20	3523 H14	3541 C16	3549 E14	3557 G14	3570 D2	3578 G11	3590 C18	4402 C4	6403 J13	6411 J17	6468 A16	6476 D14	6484 G20	7405 H11	7426 G10	9406 A21
3507 B18	3516 I12	3534 A16	3542 D16	3550 E14	3558 G14	3571 D3	3580 A21	3591 E6	4403 C5	6404 I13	6461 B4	6469 B16	6477 C14	6485 D5	7406 H15	7427 I8	9407 B20
3508 B17	3517 I16	3535 A16	3543 D16	3551 E14	3559 G14	3572 D4	3581 A20	3592 H11	5400 B3	6405 I13	6462 F14	6470 C16	6478 C14	6486 A4	7420 C2	9400 A5	9408 B20
3509 C18	3518 I16	3536 A16	3544 E16	3552 F15	3560 A5	3573 D4	3582 B20	3593 E2	5401 E5	6406 I17	6463 G14	6471 B16	6479 B14	6487 D14	7421 C3	9401 A6	9409 B20
3510 C18	3519 I17	3537 B16	3545 E16	3553 F14	3561 A6	3574 D5	3583 B20	3595 B17	5402 H4	6407 I17	6464 E14	6472 C16	6480 B14	7400 C12	7422 C4	9402 A14	9446 H17
3511 C17	3520 I17	3538 B16	3546 E16	3554 F14	3566 J12	3575 D6	3585 D18	3596 B17	5410 H18	6408 I17	6465 E15	6473 C16	6481 B14	7402 E6	7423 C4	9403 A14	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H
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J
1415
7400
TMP87CN71
I/O PORT 7
I/O PORT 8
I/O PORT 9
I/O PORT 6
I/O PORT 0
I/O PORT 4
I/O PORT 5
I/O PORT 3
I/O PORT 1
DATA MEMORY (RAM) 1024X8 BIT
PROGR MEMORY (ROM) 48KX8 BIT
PROGRAM COUNTER
CPU
16 BIT TIMER/COUNTER
INTERRUPT CONTROLLER
8 BIT TIMER/COUNTER
CLOCK/TIMING CONTROLLER (I/O PORT 2)
6 BIT A/D-CONVERTER
7402
ST24C01B6
#7424 BC847B
7425 BC847B
1409 EC16
JOG RE
1410 EC16
WC40
VOL RE
RDS
7404
7427 BC847B
7426 BC847B
7405 74HC4094D
7406 74HC4094D
SRG8
Standby LED PCB
WIRE-PAD 0200
WIRE-PAD 0100
9403
NEWS (RETURN)
RDS (PBC)
DOLBY B
DSC
DBB
I.S
DUBBING
RECORD
JOG DOWN
STANDBY
TIMER
JOG UP
S.BACK
S.UP
STOP
PLAY
PREV
NEXT
PROG
CD
TUNER
TAPE
AUX
REVERSE
DPL
DIPMATE 20
TO VCD
FFC 1400 FOR FW7YY
1401 FOR FW6YY
1403 FOR VCD
TO CDC-KEY FW6XX
FFC 1402

Set Power	Setting2	Setting1
20W	0	0
40W,50W	0	1
70W,80W, 100W,120W	1	0

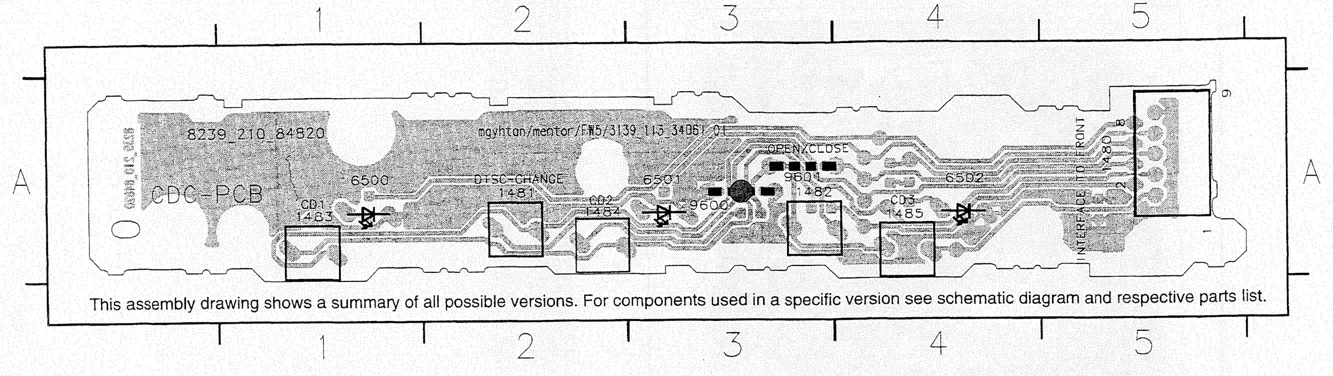
ITEM NO	FUNCTION	Colour
6402	CD SELECT	Red
6403	TAPE SELECT	Red
6404	TUNER SELECT	Red
6405	AUX SELECT	Red
6406	CENTER LEFT	Amber
6407	CENTER RIGHT	Amber
6408	STEREO LEFT	Amber
6409	STEREO RIGHT	Amber
6410	SURROUND LEFT	Amber
6411	SURROUND RIGHT	Amber

NT : NON NTC .
NR : NON RDS ONLY
ND : NON DPL ONLY .
M : MTF ONLY.
: PROVISION ONLY .

Note : Some values may varies, see respective parts list for correct value.

KEY-CDC BOARD - COMPONENT LAYOUT

1480 A5	1481 A2	1482 A3	1483 A1	1484 A2	1485 A4	6500 A1	6501 A3	6502 A4	9600 A3	9601 A3

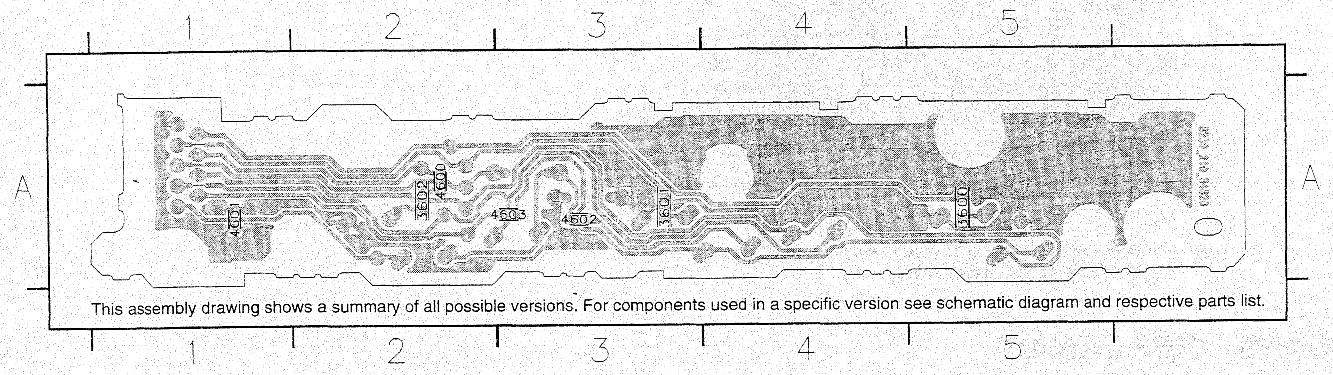

1
2
3
4
5
A
8239_210_84820
mgyhton/mentor/FW5/3139_113_34061_01
CDC-PCB
6500
CD1
1483
DISC-CHANGE
1481
CD2
1484
6501
9600
OPEN/CLOSE
9601
1482
CD3
1485
6502
INTERFACE TO FRONT
1480
9
8
2
1

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

● - Solder pad on the component side are for grounding purpose (For double-sided pc board only).

KEY-CDC BOARD - CHIP LAYOUT

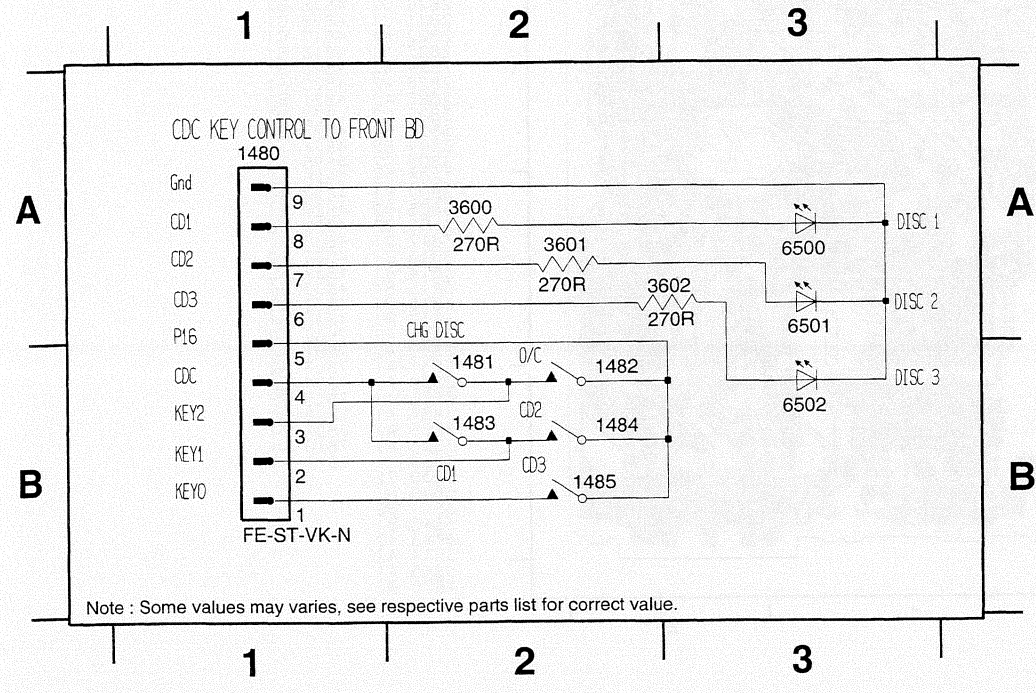
3600 A5	3601 A3	3602 A2	4600 A2	4601 A1	4602 A3	4603 A3


1
2
3
4
5
A
4601
3602
4600
4603
4602
3601
3600

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC PART - CIRCUIT DIAGRAM

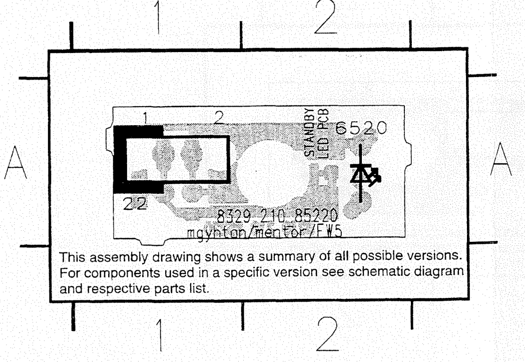
1480 A1	1482 B2	1484 B2	3600 A2	3602 A3	6501 A3
1481 B2	1483 B2	1485 B2	3601 A2	6500 A3	6502 B3


1
2
3
A
B
CDC KEY CONTROL TO FRONT BD
1480
Gnd
CD1
CD2
CD3
P16
CDC
KEY2
KEY1
KEY0
9
8
7
6
5
4
3
2
1
FE-ST-VK-N
3600
270R
3601
270R
3602
270R
6500
6501
6502
DISC 1
DISC 2
DISC 3
CHG DISC
1481
O/C
1482
1483
CD2
1484
CD1
CD3
1485

Note : Some values may varies, see respective parts list for correct value.

STANDBY LED BOARD - COMPONENT LAYOUT

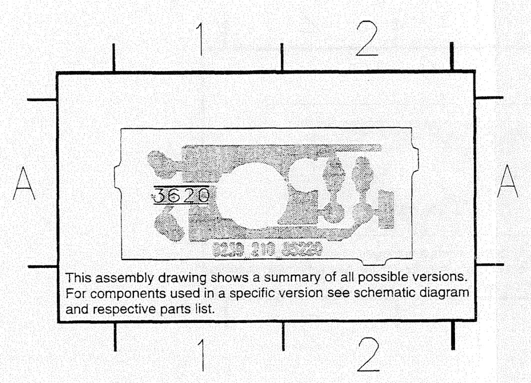
22 A1	6520 A2


1
2
A
STANDBY LED PCB
6520
22
8329_210_85220
mgyhton/mentor/FW5

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED BOARD - CHIP LAYOUT

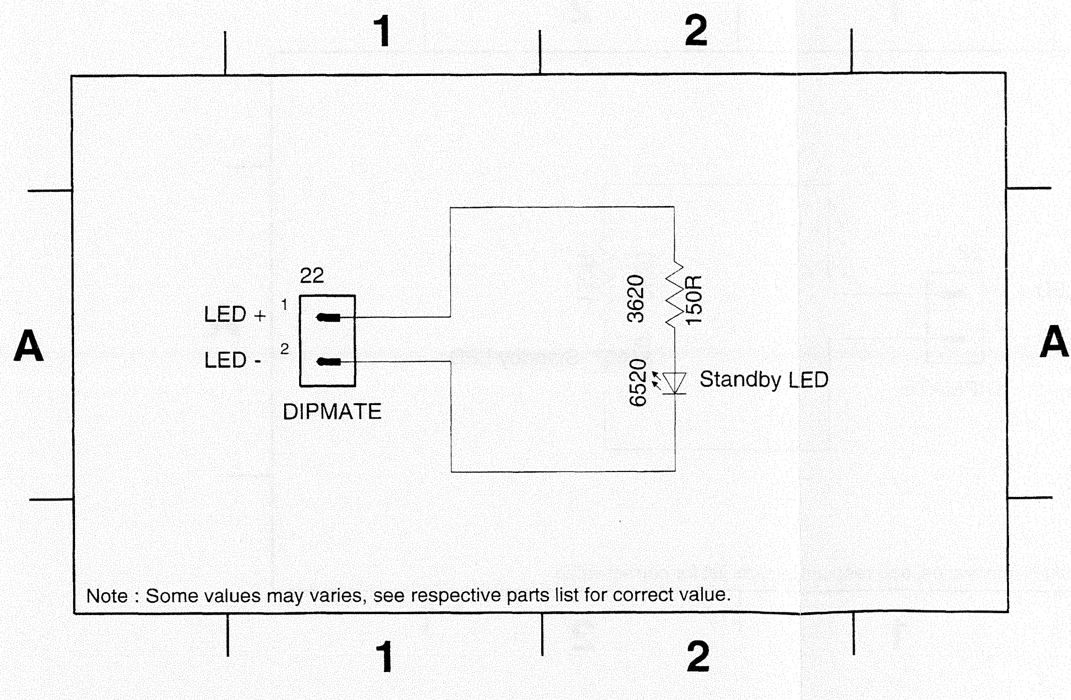
3620 A1



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED PART - CIRCUIT DIAGRAM

22 A1	3620 A2	6520 A2


1
2
A
22
LED +
LED -
1
2
DIPMATE
3620
150R
6520
Standby LED

Note : Some values may varies, see respective parts list for correct value.

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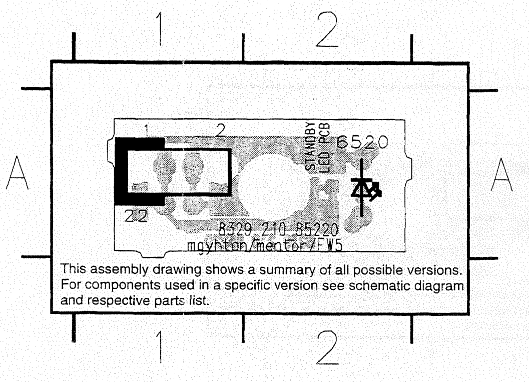
STANDBY LED BOARD - COMPONENT LAYOUT

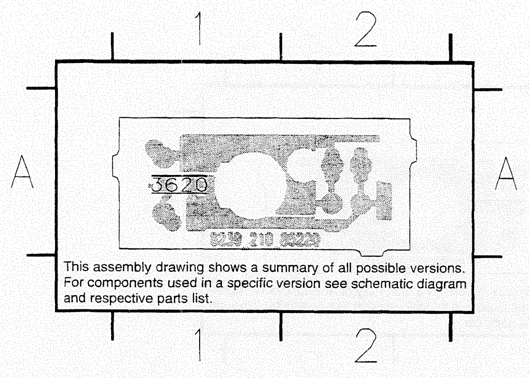
22 A1 6520 A2


1
2
A
A
1
2
STANDBY LED PCB
6520
22
8329 210 85220
mcyhton/mentor/FW5
1
2

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

STANDBY LED BOARD - CHIP LAYOUT

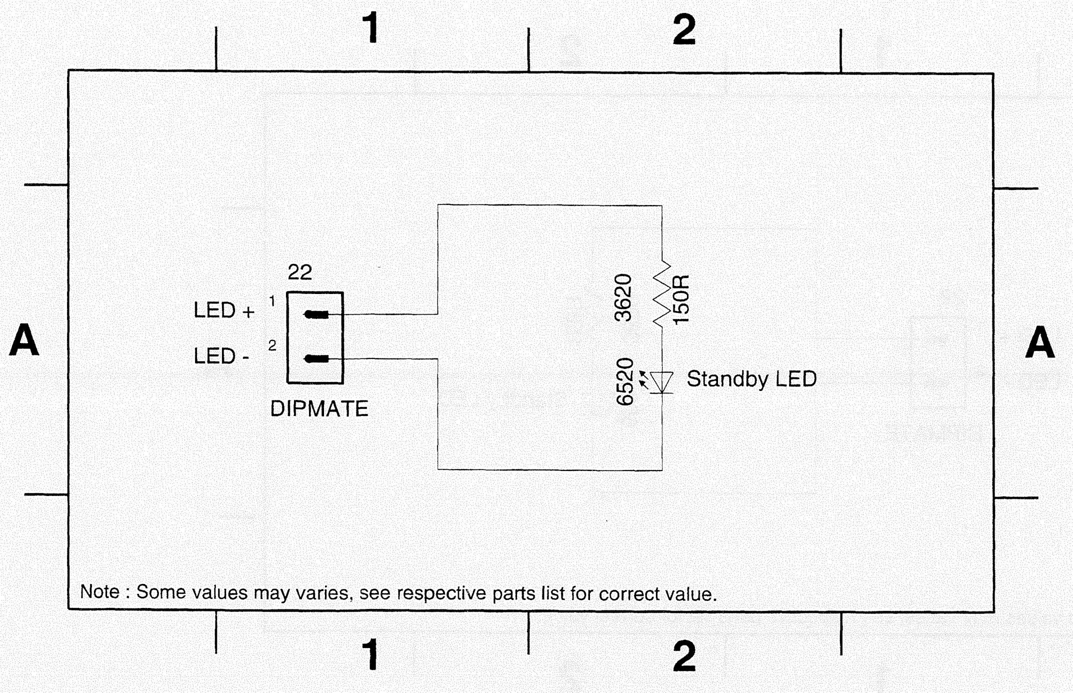
3620 A1


1
2
A
A
3620
8239 210 85220
1
2

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

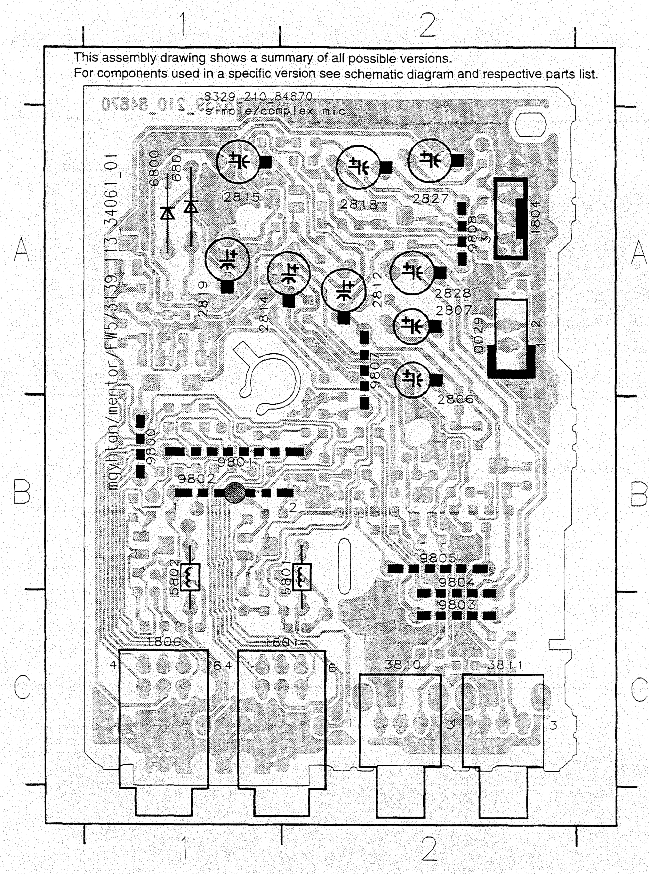
STANDBY LED PART - CIRCUIT DIAGRAM

22 A1 **3620 A2** **6520 A2**


1
2
A
A
22
LED +
LED -
1
2
DIPMATE
3620
150R
6520
Standby LED
1
2

Note : Some values may varies, see respective parts list for correct value.

KARAOKE BOARD - COMPONENT LAYOUT

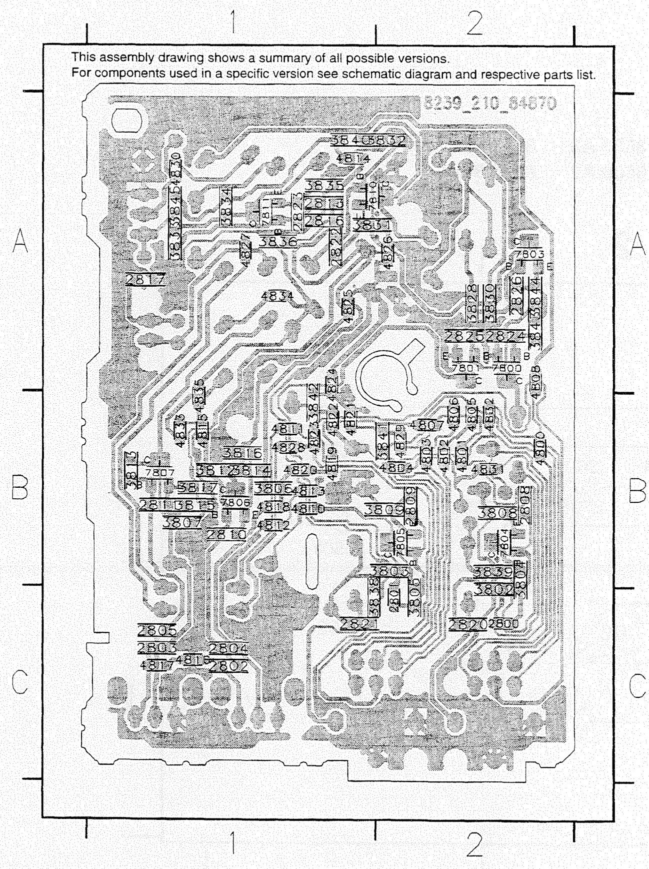

1
2
A
A
B
B
C
C
8329 210 84870
simple/complex mic
1804
2815
2818
2827
2819
2814
2812
2828
2807
2806
0029
6800
6801
9800
9801
9802
9805
9804
9803
5802
5801
1800
1801
3810
3811
1
2

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

0029	A2
1800	C1
1801	C1
1804	A2
2806	B2
2807	A2
2812	A2
2814	A1
2815	A1
2818	A2
2819	A1
2827	A2
2828	A2
3810	C2
3811	C2
5801	B2
5802	B1
6800	A1
6801	A1
9800	B1
9801	B1
9802	B1
9803	C2
9804	B2
9805	B2
9807	A2
9808	A2

● - Solder pad on the component side are for grounding purpose (For double-sided pc board only).

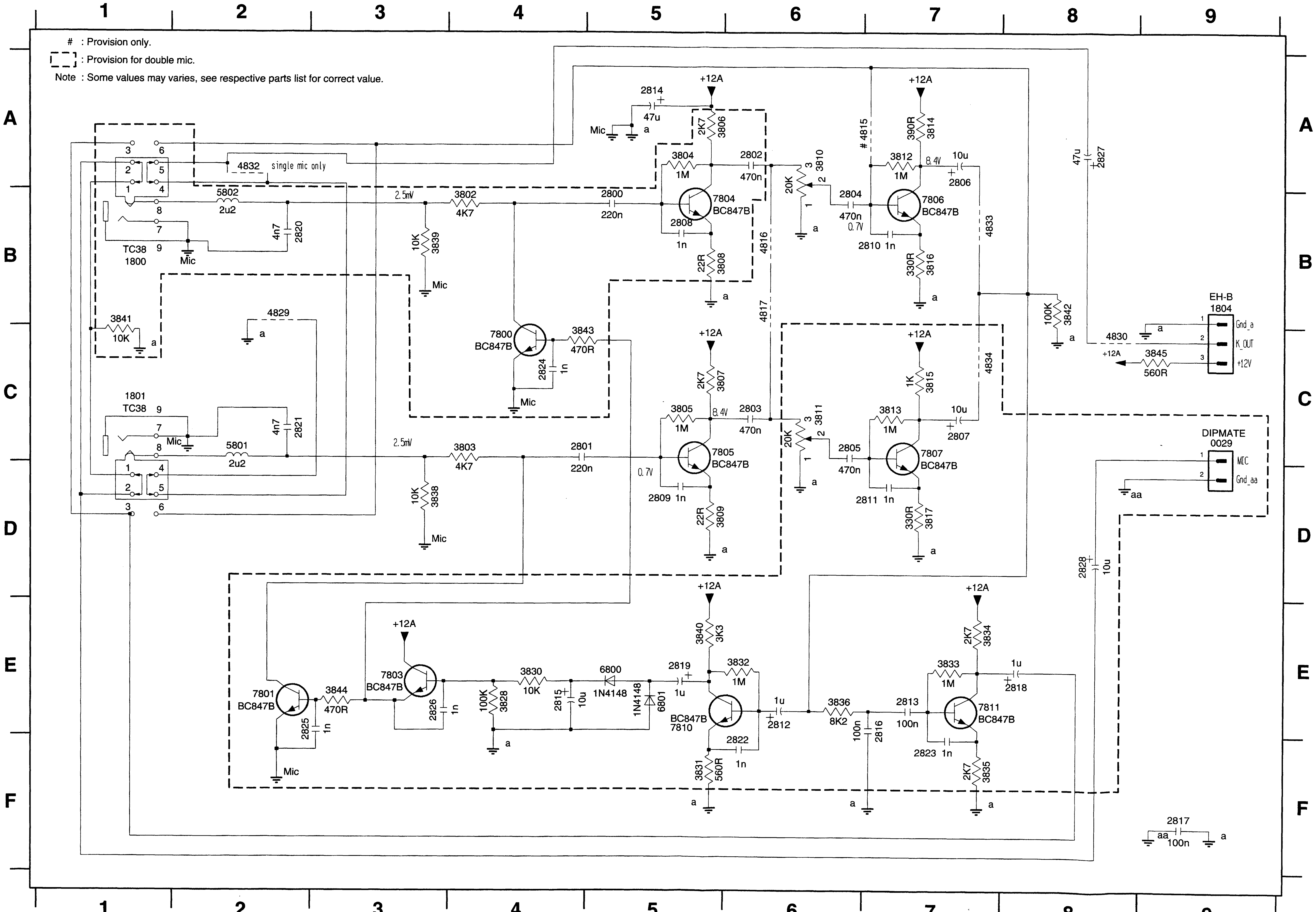
KARAOKE BOARD - CHIP LAYOUT


1
2
A
A
B
B
C
C
8239 210 84870
1
2

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

2800	C2
2801	C2
2802	C1
2803	C1
2804	C1
2805	C1
2808	B2
2809	B2
2810	B1
2811	B1
2813	A1
2816	A1
2817	A1
2820	C2
2821	C1
2822	A1
2823	A1
2824	A2
2825	A2
2826	A2
3802	C2
3803	B2
3804	B2
3805	C2
3806	B1
3807	B1
3808	B2
3809	B2
3812	B1
3813	B1
3814	B1
3815	B1
3816	B1
3817	B1
3828	A2
3830	A2
3831	A1
3832	A2
3833	A1
3834	A1
3835	A1
3836	A1
3838	C1
3839	B2
3840	A1
3841	B2
3842	B1
3843	A2
3844	A2
3845	A1
4800	B2
4801	B2
4802	B2
4803	B2
4804	B2
4805	B2
4806	B2
4807	B2
4808	A2
4810	B1
4811	B1
4812	B1
4813	B1
4814	A1
4815	B1
4816	C1
4817	C1
4818	B1
4819	B1
4820	B1
4821	B1
4822	B1
4823	B1
4824	A1
4825	A1
4826	A2
4827	A1
4828	B1
4829	B2
4830	A1
4831	B2
4832	B2
4833	B1
4834	A1
4835	B1
7800	A2
7801	A2
7803	A2
7804	B2
7805	B2
7806	B1
7807	B1
7810	A1
7811	A1

KARAOKE PART - CIRCUIT DIAGRAM


: Provision only.
[ ] : Provision for double mic.
Note : Some values may varies, see respective parts list for correct value.

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
4832 single mic only
5802 2u2
5801 2u2
TC38 1800
1801 TC38
2820 4n7
2821 4n7
Mic
3841 10K
4829
2.5mV
3802 4K7
3803 4K7
3839 10K
3838 10K
7800 BC847B
3843 470R
2824 1n
2814 47u
+12A
3806 2K7
3804 1M
2802 470n
2800 220n
7804 BC847B
2808 1n
3808 22R
4816
4817
3807 2K7
3805 1M
8.4V
2803 470n
2801 220n
0.7V
7805 BC847B
2809 1n
3809 22R
3810 20K
3811 20K
2804 470n
2805 470n
# 4815
3814 390R
3812 1M
2806 10u
7806 BC847B
2810 1n
3816 330R
4833
4834
3815 1K
3813 1M
2807 10u
7807 BC847B
2811 1n
3817 330R
2827 47u
3842 100K
EH-B 1804
Gnd_a
K_OUT
+12V
4830
3845 560R
DIPMATE 0029
MIC
Gnd_aa
aa
2828 10u
7801 BC847B
3844 470R
2825 1n
7803 BC847B
2826 1n
3828 100K
3830 10K
2815 10u
6800 1N4148
6801 1N4148
2819 1u
3840 3K3
3832 1M
7810 BC847B
2812 1u
2822 1n
3831 560R
3836 8K2
2816 100n
2813 100n
3833 1M
3834 2K7
2818 1u
7811 BC847B
2823 1n
3835 2K7
2817 100n
a

0029	C9
1800	B1
1801	C1
1804	B9
2800	B5
2801	C4
2802	A6
2803	C6
2804	B6
2805	C6
2806	A7
2807	C7
2808	B5
2809	D5
2810	B7
2811	D7
2812	E6
2813	E7
2814	A5
2815	E4
2816	E7
2817	F9
2818	E8
2819	E5
2820	B2
2821	C2
2822	F6
2823	F7
2824	C4
2825	E2
2826	E3
2827	A8
2828	D8
3802	B4
3803	C4
3804	A5
3805	C5
3806	A5
3807	C5
3808	B5
3809	D5
3810	A6
3811	C6
3812	A7
3813	C7
3814	A7
3815	C7
3816	B7
3817	D7
3828	E4
3830	E4
3831	F5
3832	E6
3833	E7
3834	E7
3835	F7
3836	E6
3838	D3
3839	B3
3840	E5
3841	B1
3842	B8
3843	C4
3844	E3
3845	C9
4815	A7
4816	B6
4817	B6
4829	B2
4830	C8
4832	A2
4833	B7
4834	C7
5801	C2
5802	B2
6800	E5
6801	E5
7800	C4
7801	E2
7803	E3
7804	B5
7805	C5
7806	B7
7807	C7
7810	E5
7811	E7

MISCELLANEOUS

1400	4822 265 11182	Flex Connector 23P
1401	4822 267 10757	Flex Connector 23P
1402	4822 265 11531	Flex Connector 9P
1404	4822 267 10953	Flex Connector 7P
1408	4822 242 72195	QUARZ 4,332MHz
1409	4822 273 10366	Rotary Encoder 24P
1410	4822 273 10365	Rotary Encoder 24P
1411	4822 242 72066	Ceramic Resonator
1412	4822 242 70938	X'tal Resonator 32,768kHz
1415	4822 135 00273	FTD Display
1441	4822 276 13775	Tact Switch
1442	4822 276 13775	Tact Switch
1443	4822 276 13775	Tact Switch
1444	4822 276 13775	Tact Switch
1445	4822 276 13775	Tact Switch
1447	4822 276 13775	Tact Switch
1448	4822 276 13775	Tact Switch
1450	4822 276 13775	Tact Switch
1451	4822 276 13775	Tact Switch
1452	4822 276 13775	Tact Switch
1453	4822 276 13775	Tact Switch
1454	4822 276 13775	Tact Switch
1455	4822 276 13775	Tact Switch
1456	4822 276 13775	Tact Switch
1457	4822 276 13775	Tact Switch
1458	4822 276 13775	Tact Switch
1459	4822 276 13775	Tact Switch
1460	4822 276 13775	Tact Switch
1461	4822 276 13775	Tact Switch
1462	4822 276 13775	Tact Switch
1463	4822 276 13775	Tact Switch
1464	4822 276 13775	Tact Switch
1480	4822 265 11531	Flex Connector 9P
1481	4822 276 13775	Tact Switch
1482	4822 276 13775	Tact Switch
1483	4822 276 13775	Tact Switch
1484	4822 276 13775	Tact Switch
1485	4822 276 13775	Tact Switch
1801	4822 265 11529	Headphone Socket

CAPACITORS

2400	5322 122 32448	10pF 5% 50V
2401	5322 122 32448	10pF 5% 50V
2402	5322 122 32448	10pF 5% 50V
2403	4822 126 13692	47pF 1% 63V
2404	4822 126 13692	47pF 1% 63V
2405	4822 126 13692	47pF 1% 63V
2406	4822 126 13692	47pF 1% 63V
2407	4822 126 13692	47pF 1% 63V
2408	4822 122 33173	560pF 10% 50V
2409	4822 122 33173	560pF 10% 50V
2410	4822 124 41576	2,2µF 20% 50V
2411	4822 126 13196	100nF 10% 25V
2412	4822 126 13692	47pF 1% 63V
2413	4822 126 13692	47pF 1% 63V
2414	4822 126 13692	47pF 1% 63V
2415	5322 122 32448	10pF 5% 50V
2416	5322 122 32448	10pF 5% 50V
2417	4822 126 13486	15pF 2% 63V
2418	4822 126 13486	15pF 2% 63V
2419	5322 122 32659	33pF 5% 50V
2420	5322 122 32659	33pF 5% 50V
2421	4822 126 13694	68pF 1% 63V
2422	4822 122 33177	10nF 20% 50V
2423	4822 122 33177	10nF 20% 50V
2424	4822 121 51387	10nF 20% 16V
2425	4822 121 51387	10nF 20% 16V
2426	4822 124 80483	47µF 20% 6,3V
2428	4822 124 80483	47µF 20% 6,3V
2431	5322 122 32531	100pF 5% 50V
2432	5322 122 32531	100pF 5% 50V
2433	5322 122 32531	100pF 5% 50V
2434	5322 122 32531	100pF 5% 50V
2435	5322 122 32531	100pF 5% 50V
2436	5322 122 32531	100pF 5% 50V
2441	5322 122 32531	100pF 5% 50V
2442	5322 122 32531	100pF 5% 50V
2445	4822 126 13196	100nF 10% 25V
2446	4822 126 13695	82pF 1% 63V
2447	4822 126 13692	47pF 1% 63V
2448	4822 126 13751	47nF 10% 63V
2449	4822 122 33175	2,2nF 20% 50V
2450	4822 122 33808	10nF 20% 50V
2451	4822 126 13196	100nF 10% 25V
2452	4822 122 33808	10nF 20% 50V
2453	4822 126 13581	0,22µF 20% 50V
2454	5322 126 10184	680pF 5% 50V
2455	4822 126 13581	0,22µF 20% 50V
2456	5322 122 31866	6,8nF 10% 63V
2457	4822 126 13196	100nF 10% 25V
2458	4822 124 40746	0,22µF 20% 63V
2459	4822 126 12944	47nF 10% 50V
2460	4822 126 13836	1µF 16V
2462	4822 126 14118	100nF +80/-20% 50V
2463	4822 126 13196	100nF 10% 25V
2464	5322 122 32531	100pF 5% 50V
2465	4822 124 80483	47µF 20% 6,3V
2470	4822 122 33575	220pF 5% 50V
2471	4822 122 33575	220pF 5% 50V
2472	4822 122 33575	220pF 5% 50V
2481	4822 124 80483	47µF 20% 6,3V
2482	5322 122 32659	33pF 5% 50V
2483	4822 126 13836	1µF 16V
2484	4822 126 13836	1µF 16V

2485	4822 126 13836	1µF 16V
2486	4822 126 13836	1µF 16V
2487	4822 126 13196	100nF 10% 25V
2488	4822 126 10002	100nF 20% 25V
2489	4822 126 10002	100nF 20% 25V
2801	4822 126 13061	220nF 20% 25V
2803	4822 126 13482	470nF +80/-20% 16V
2804	4822 126 13482	470nF +80/-20% 16V
2806	4822 124 41579	10µF 20% 50V
2809	5322 122 34123	1nF 10% 50V
2810	5322 122 34123	1nF 10% 50V
2814	4822 124 40433	47µF 20% 25V
2817	4822 126 13196	100nF 10% 25V
2821	5322 126 10223	4,7nF 10% 63V
2827	4822 124 40433	47µF 20% 25V

RESISTORS

3397	4822 051 20331	330R 5% 0,1W
3400	4822 051 10102	1k 2% 0,25W
3401	4822 117 10833	10k 1% 0,1W
3402	4822 051 10102	1k 2% 0,25W
3403	4822 117 10833	10k 1% 0,1W
3404	4822 051 20182	1k8 5% 0,1W
3405	4822 117 10833	10k 1% 0,1W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 117 10833	10k 1% 0,1W
3409	4822 051 20471	470R 5% 0,1W
3410	4822 051 10102	1k 2% 0,25W
3411	4822 051 10102	1k 2% 0,25W
3412	4822 051 10102	1k 2% 0,25W
3413	4822 051 10102	1k 2% 0,25W
3414	4822 051 10102	1k 2% 0,25W
3415	4822 051 10102	1k 2% 0,25W
3416	4822 117 11449	2k2 1% 0,1W
3417	4822 051 20471	470R 5% 0,1W
3418	4822 051 20471	470R 5% 0,1W
3419	4822 051 10102	1k 2% 0,25W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3423	4822 051 20101	100R 5% 0,1W
3424	4822 051 20101	100R 5% 0,1W
3425	4822 051 20101	100R 5% 0,1W
3426	4822 051 20101	100R 5% 0,1W
3427	4822 051 10102	1k 2% 0,25W
3428	4822 051 10102	1k 2% 0,25W
3429	4822 051 20101	100R 5% 0,1W
3430	4822 051 20101	100R 5% 0,1W
3431	4822 051 20101	100R 5% 0,1W
3432	4822 051 20101	100R 5% 0,1W
3433	4822 051 20101	100R 5% 0,1W
3434	4822 051 20101	100R 5% 0,1W
3435	4822 051 20101	100R 5% 0,1W
3436	4822 051 20101	100R 5% 0,1W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 10102	1k 2% 0,25W
3449	4822 051 10102	1k 2% 0,25W
3450	4822 051 10102	1k 2% 0,25W
3451	4822 051 10102	1k 2% 0,25W
3452	4822 051 10102	1k 2% 0,25W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 051 10102	1k 2% 0,25W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 051 10102	1k 2% 0,25W
3457	4822 051 10102	1k 2% 0,25W
3458	4822 051 10102	1k 2% 0,25W
3459	4822 051 10102	1k 2% 0,25W
3460	4822 051 10102	1k 2% 0,25W
3461	4822 051 10102	1k 2% 0,25W
3462	4822 051 10102	1k 2% 0,25W
3463	4822 051 10102	1k 2% 0,25W
3464	4822 051 10102	1k 2% 0,25W
3465	4822 051 10102	1k 2% 0,25W
3466	4822 051 10102	1k 2% 0,25W
3467	4822 051 10102	1k 2% 0,25W
3468	4822 051 20105	1M 5% 0,1W
3469	4822 117 10833	10k 1% 0,1W
3470	4822 117 10833	10k 1% 0,1W
3471	4822 117 11449	2k2 1% 0,1W
3472	4822 117 10833	10k 1% 0,1W
3473	4822 117 10833	10k 1% 0,1W
3474	4822 116 52175	100R 5% 0,5W
3475	4822 116 52175	100R 5% 0,5W
3476	4822 117 10834	47k 1% 0,1W
3479	4822 051 10102	1k 2% 0,25W
3480	4822 051 10102	1k 2% 0,25W
3481	4822 051 10102	1k 2% 0,25W
3482	4822 051 10102	1k 2% 0,25W
3483	4822 051 10102	1k 2% 0,25W
3484	4822 117 10833	10k 1% 0,1W
3485	4822 117 10833	10k 1% 0,1W
3486	4822 116 83864	10k 5% 0,5W
3487	4822 117 13579	220k 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3488	4822 117 11449	2k2 1% 0,1W
3489	4822 117 10833	10k 1% 0,1W
3490	4822 117 10833	10k 1% 0,1W
3491	4822 117 10833	10k 1% 0,1W
3492	4822 117 10833	10k 1% 0,1W
3493	4822 117 10833	10k 1% 0,1W
3494	4822 117 10833	10k 1% 0,1W
3497	4822 051 20101	100R 5% 0,1W
3498	4822 117 10833	10k 1% 0,1W
3499	4822 051 10102	1k 2% 0,25W
3500	4822 051 10102	1k 2% 0,25W
3501	4822 051 20104	100k 5% 0,1W
3503	4822 051 10102	1k 2% 0,25W
3504	4822 051 20471	470R 5% 0,1W
3505	4822 051 20471	470R 5% 0,1W
3506	4822 051 20182	1k8 5% 0,1W
3507	4822 051 20471	470R 5% 0,1W
3508	4822 051 20182	1k8 5% 0,1W
3509	4822 117 11503	220R 1% 0,1W
3510	4822 117 11503	220R 1% 0,1W
3511	4822 116 52298	680k 5% 0,5W
3512	4822 051 20471	470R 5% 0,1W
3513	4822 051 20471	470R 5% 0,1W
3514	4822 051 20331	330R 5% 0,1W
3516	4822 117 11503	220R 1% 0,1W
3517	4822 116 52213	180R 5% 0,5W
3518	4822 116 52213	180R 5% 0,5W
3519	4822 116 52213	180R 5% 0,5W
3520	4822 116 52213	180R 5% 0,5W
3521	4822 116 52213	180R 5% 0,5W
3522	4822 116 52213	180R 5% 0,5W
3523	4822 117 10833	10k 1% 0,1W
3534	4822 051 20331	330R 5% 0,1W
3535	4822 051 20331	330R 5% 0,1W
3536	4822 051 20331	330R 5% 0,1W
3537	4822 051 20331	330R 5% 0,1W
3538	4822 051 20331	330R 5% 0,1W
3539	4822 051 20331	330R 5% 0,1W
3540	4822 051 20331	330R 5% 0,1W
3541	4822 051 20331	330R 5% 0,1W
3542	4822 051 20331	330R 5% 0,1W
3543	4822 051 20331	330R 5% 0,1W
3544	4822 051 20474	470k 5% 0,1W
3545	4822 051 20474	470k 5% 0,1W
3546	4822 051 20474	470k 5% 0,1W
3547	4822 051 20474	470k 5% 0,1W
3548	4822 117 11139	1k5 1% 0,1W
3549	4822 051 20684	680k 5% 0,1W
3550	4822 117 10834	47k 1% 0,1W
3551	4822 051 20474	470k 5% 0,1W
3552	4822 117 11139	1k5 1% 0,1W
3553	4822 051 20684	680k 5% 0,1W
3554	4822 117 10834	47k 1% 0,1W
3555	4822 051 20474	470k 5% 0,1W
3556	4822 117 11139	1k5 1% 0,1W
3557	4822 051 20684	680k 5% 0,1W
3558	4822 117 10834	47k 1% 0,1W
3559	4822 051 20474	470k 5% 0,1W
3566	4822 117 11503	220R 1% 0,1W
3567	4822 117 11503	220R 1% 0,1W
3568	4822 117 11503	220R 1% 0,1W
3570	4822 117 11149	82k 1% 0,1W
3571	4822 117 11149	82k 1% 0,1W
3572	4822 117 11149	82k 1% 0,1W
3575	4822 117 11149	82k 1% 0,1W
3576	4822 051 10102	1k 2% 0,25W
3577	4822 051 20182	1k8 5% 0,1W
3578	4822 117 10833	10k 1% 0,1W
3585	4822 051 20105	1M 5% 0,1W
3586	4822 116 83884	47k 5% 0,5W
3587	4822 116 83884	47k 5% 0,5W
3592	4822 116 83864	10k 5% 0,5W
3595	4822 051 20182	1k8 5% 0,1W
3596	4822 051 20182	1k8 5% 0,1W
3600	4822 117 11504	270R 1% 0,1W
3601	4822 117 11504	270R 1% 0,1W
3602	4822 117 11504	270R 1% 0,1W
3803	4822 051 20472	4k7 5% 0,1W
3805	4822 051 20105	1M 5% 0,1W
3807	4822 117 12955	2k7 1% 0,1W
3809	4822 051 20229	22R 5% 0,1W
3810	4822 101 21204	POTM 20kA Rotary
3812	4822 051 20105	1M 5% 0,1W
3814	4822 051 20391	390R 5% 0,1W
3816	4822 051 20331	330R 5% 0,1W
3838	4822 117 10833	10k 1% 0,1W
3842	4822 051 20104	100k 5% 0,1W
4400	4822 051 20008	0R Jumper 0805
4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4422	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4432	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD

4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805
4452	4822 051 20008	0R Jumper 0805
4453	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4457	4822 051 20008	0R Jumper 0805
4458	4822 051 20008	0R Jumper 0805
4459	4822 051 20008	0R Jumper 0805
4460	4822 051 20008	0R Jumper 0805
4461	4822 051 20008	0R Jumper 0805
4462	4822 051 20008	0R Jumper 0805
4463	4822 051 20008	0R Jumper 0805
4464	4822 051 20008	0R Jumper 0805
4465	4822 051 20008	0R Jumper 0805
4466	4822 051 20008	0R Jumper 0805
4467	4822 051 20008	0R Jumper 0805
4468	4822 051 20008	0R Jumper 0805
4469	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4473	4822 051 20008	0R Jumper 0805
4474	4822 051 20008	0R Jumper 0805
4475	4822 051 20008	0R Jumper 0805
4476	4822 051 20008	0R Jumper 0805
4477	4822 051 20008	0R Jumper 0805
4478	4822 051 20008	0R Jumper 0805
4479	4822 051 20008	0R Jumper 0805
4480	4822 051 20008	0R Jumper 0805
4481	4822 051 20008	0R Jumper 0805
4482	4822 051 20008	0R Jumper 0805
4484	4822 051 20008	0R Jumper 0805
4485	4822 051 20008	0R Jumper 0805
4490	4822 051 20008	0R Jumper 0805
4492	4822 051 20008	0R Jumper 0805
4493	4822 051 20008	0R Jumper 0805
4494	4822 051 20008	0R Jumper 0805
4495	4822 051 20008	0R Jumper 0805
4496	4822 051 20008	0R Jumper 0805
4497	4822 051 20008	0R Jumper 0805
4600	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4800	4822 051 20008	0R Jumper 0805
4803	4822 051 20008	0R Jumper 0805
4806	4822 051 20008	0R Jumper 0805
4808	4822 051 20008	0R Jumper 0805
4809	4822 051 20008	0R Jumper 0805
4810	4822 051 20008	0R Jumper 0805
4812	4822 051 20008	0R Jumper 0805
4813	4822 051 20008	0R Jumper 0805
4814	4822 051 20008	0R Jumper 0805
4816	4822 051 20008	0R Jumper 0805
4817	4822 051 20008	0R Jumper 0805
4821	4822 051 20008	0R Jumper 0805
4822	4822 051 20008	0R Jumper 0805
4824	4822 051 20008	0R Jumper 0805
4825	4822 051 20008	0R Jumper 0805
4826	4822 051 20008	0R Jumper 0805
4829	4822 051 20008	0R Jumper 0805
4830	4822 051 20008	0R Jumper 0805
4832	4822 051 20008	0R Jumper 0805
4833	4822 051 20008	0R Jumper 0805
4835	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	4822 157 62552	Coil 2,2µH 5%
5401	4822 157 62552	Coil 2,2µH 5%
5402	4822 157 62552	Coil 2,2µH 5%
5801	4822 157 62552	Coil 2,2µH 5%

DIODES

6400	4822 130 31878	1N4003G
6402	4822 130 10792	LTL-1CHPE
6403	4822 130 10792	LTL-1CHPE
6404	4822 130 10792	LTL-1CHPE
6405	4822 130 10792	LTL-1CHPE
6406	4822 130 11589	LTL-1CHAE
6407	4822 130 11589	LTL-1CHAE
6408	4822 130 11589	LTL-1CHAE
6409	4822 130 11589	LTL-1CHAE
6410	4822 130 11589	LTL-1CHAE
6411	4822 130 11589	LTL-1CHAE
6461	4822 130 30621	1N4148
6462	4822 130 30621	1N4148
6463	4822 130 30621	1N4148
6464	4822 130 30621	1N4148

ELECTRICAL PARTS LIST - FRONT BOARD

DIODES

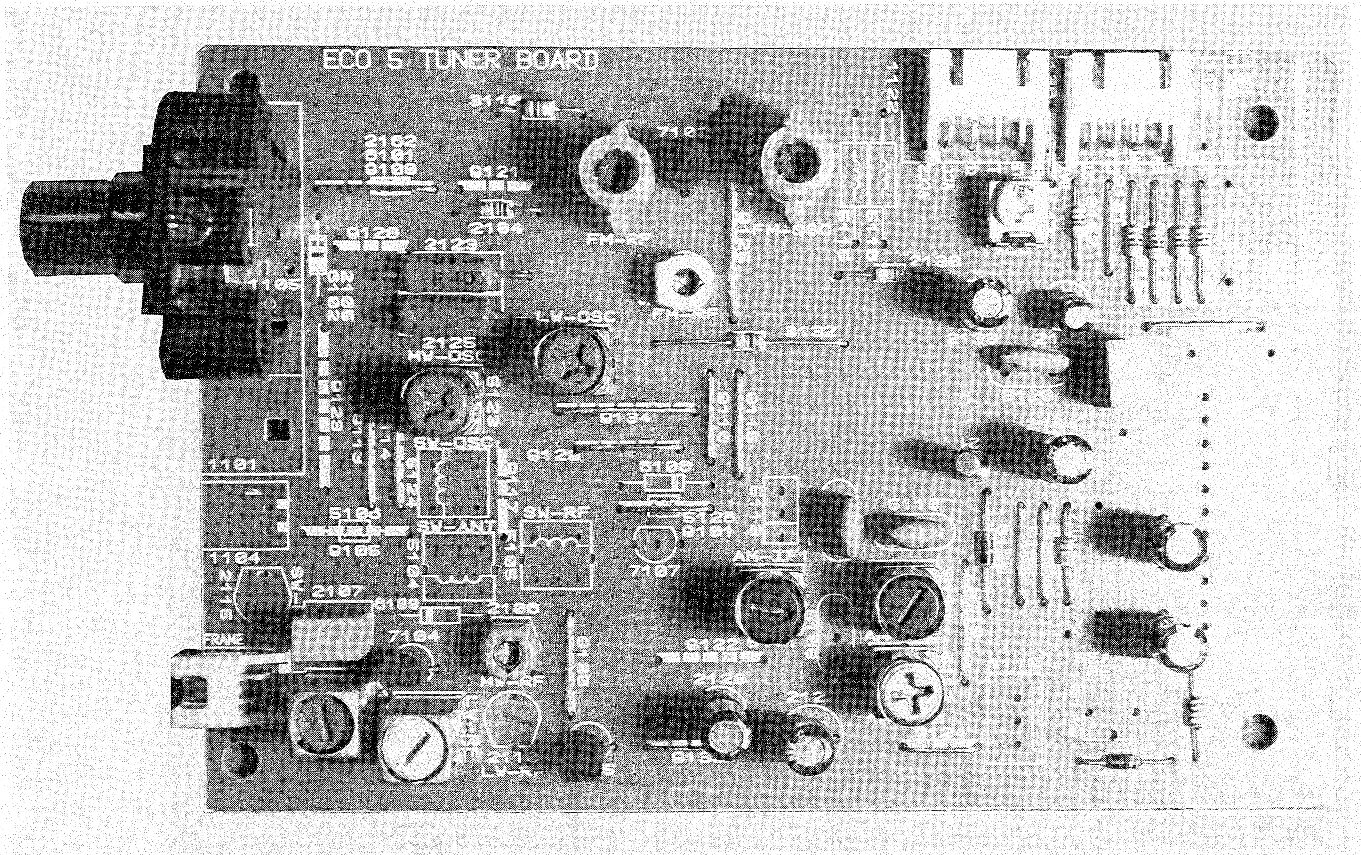
6465	4822 130 30621	1N4148
6466	4822 130 30621	1N4148
6467	4822 130 30621	1N4148
6468	4822 130 30621	1N4148
6469	4822 130 30621	1N4148
6470	4822 130 30621	1N4148
6471	4822 130 30621	1N4148
6472	4822 130 30621	1N4148
6473	4822 130 30621	1N4148
6474	4822 130 30621	1N4148
6475	4822 130 30621	1N4148
6476	4822 130 30621	1N4148
6480	4822 130 30621	1N4148
6482	4822 130 30621	1N4148
6483	4822 130 30621	1N4148
6484	4822 130 30621	1N4148
6485	4822 130 31878	1N4003G
6486	4822 130 30621	1N4148
6500	4822 130 10791	LTL-1CHGE
6501	4822 130 10791	LTL-1CHGE
6502	4822 130 10791	LTL-1CHGE

TRANSISTORS & INTEGRATED CIRCUITS

7400	4822 209 17405	TMP87CS71F-'768S51861'/37
7400	4822 209 17425	TMP87CS71F-'768S52031'/22
7402	4822 209 31508	ST24C01B6
7403	4822 209 31981	SAA6579T
7404	4822 130 10165	GP1U28XP
7405	4822 209 15449	74HC4094D
7406	4822 209 15449	74HC4094D
7420	4822 130 60511	BC847B
7421	4822 130 60511	BC847B
7422	4822 130 60511	BC847B
7425	4822 130 60511	BC847B
7426	4822 130 60511	BC847B
7427	4822 130 60511	BC847B
7805	4822 130 60511	BC847B
7806	4822 130 60511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.

BLOCKDIAGRAM


ECO 5 TUNER BOARD
FM-RF
FM-OSC
LW-OSC
MW-OSC
SW-OSC
SW-RF
SW-ANT
AM-IF1
MW-RF
LW-R
FRAME
1101
1104
1105

TUNER BOARD ECO5

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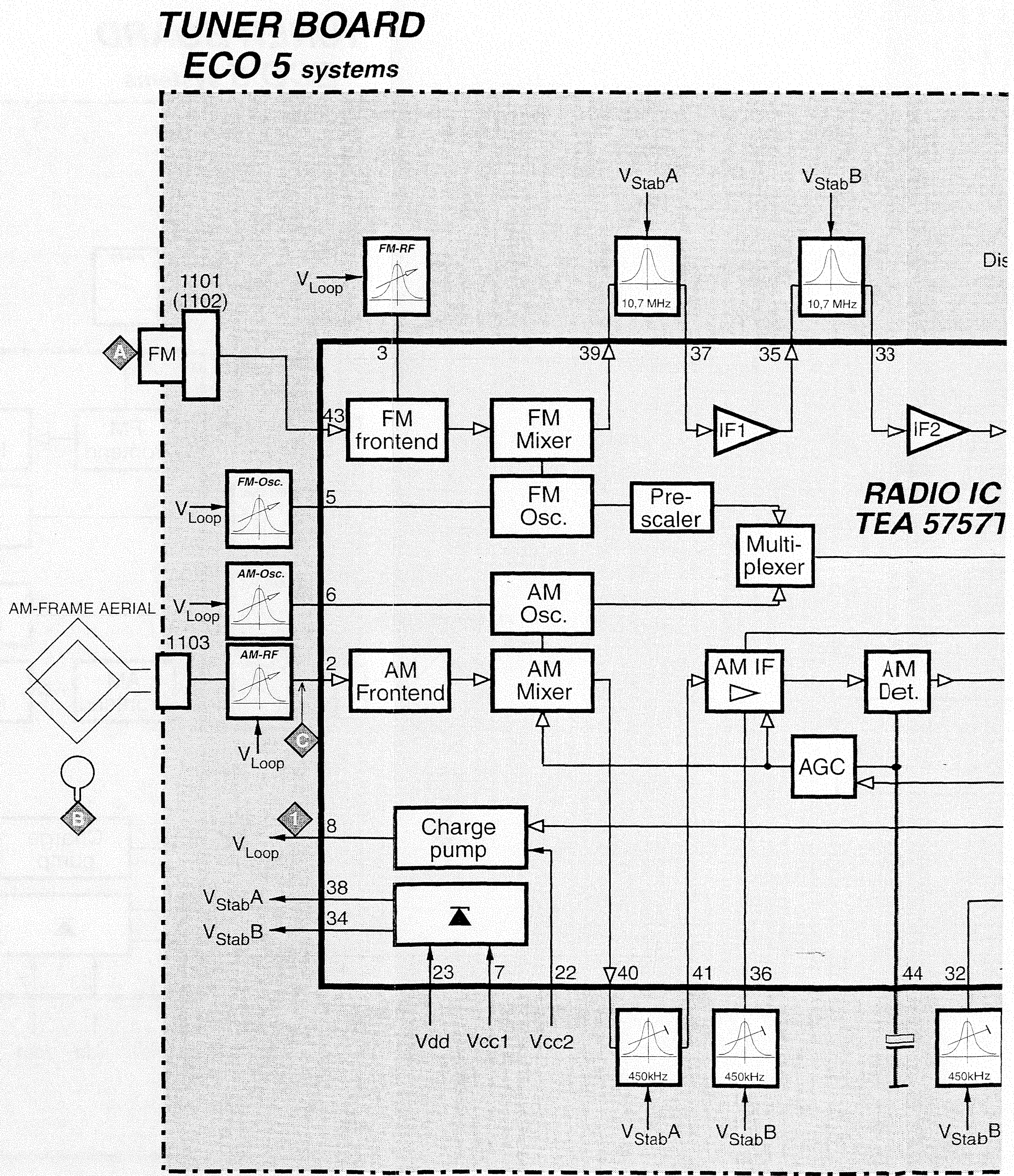
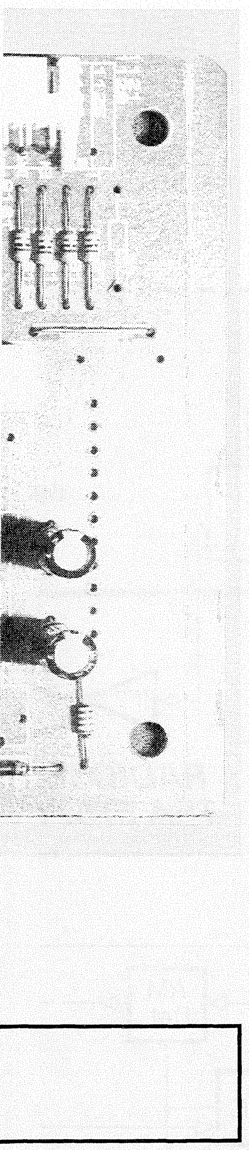
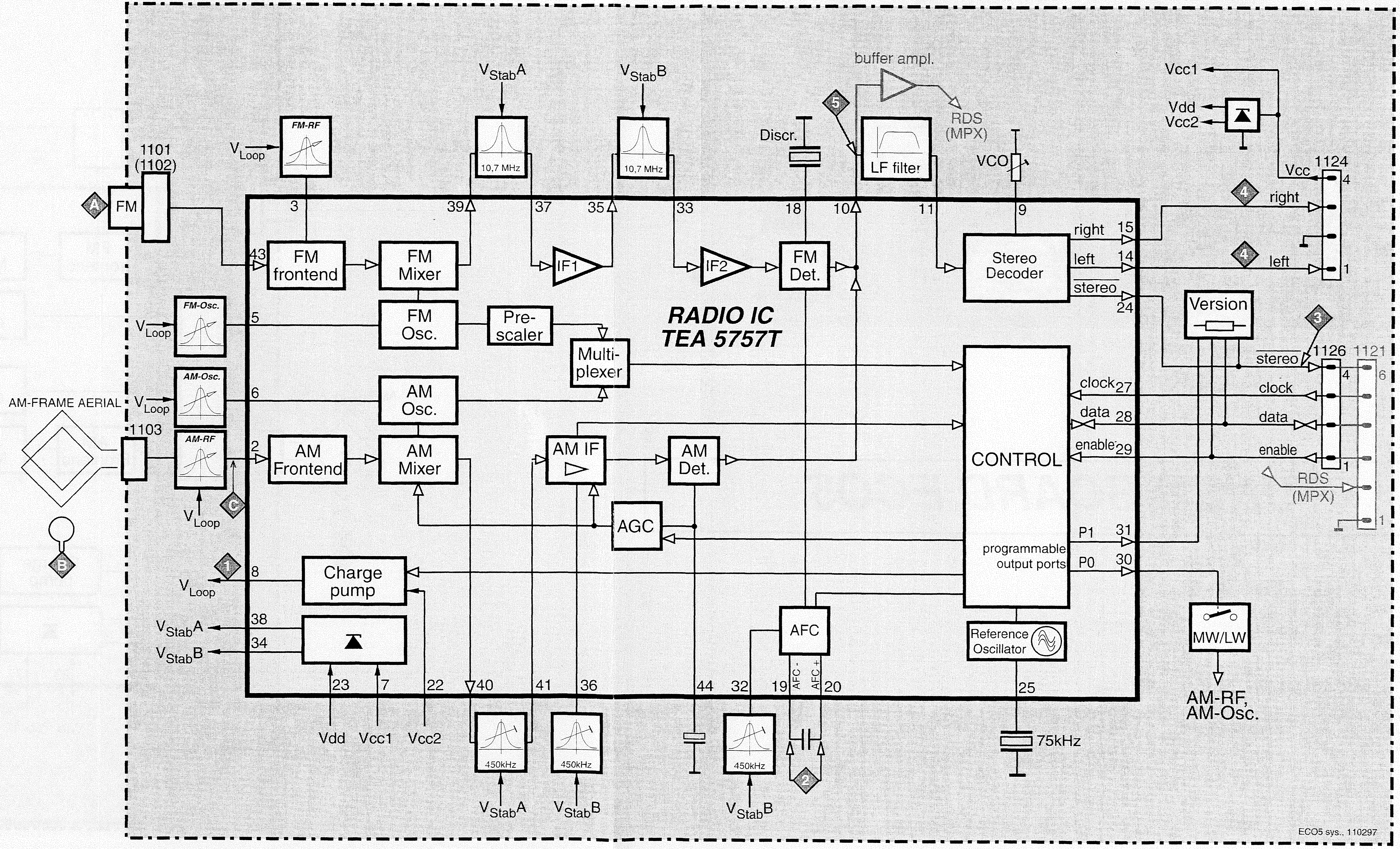
Blockdiagram 7B-1
Adjustmant table 7B-2
Component layout 7B-2
Circuit diagram 7B-3
Partslist 7B-4


TUNER BOARD
ECO 5 systems
1101
(1102)
A
FM
AM-FRAME AERIAL
1103
B
C
1
FM-RF
FM-Osc.
AM-Osc.
AM-RF
V Loop
VStabA
VStabB
10,7 MHz
450kHz
FM frontend
FM Mixer
FM Osc.
Pre-scaler
Multi-plexer
AM Osc.
AM Frontend
AM Mixer
AM IF
AM Det.
AGC
IF1
IF2
Charge pump
RADIO IC
TEA 5757
Vdd
Vcc1
Vcc2
Dis
3
39
37
35
33
43
5
6
2
8
38
34
23
7
22
40
41
36
44
32

BLOCKDIAGRAM



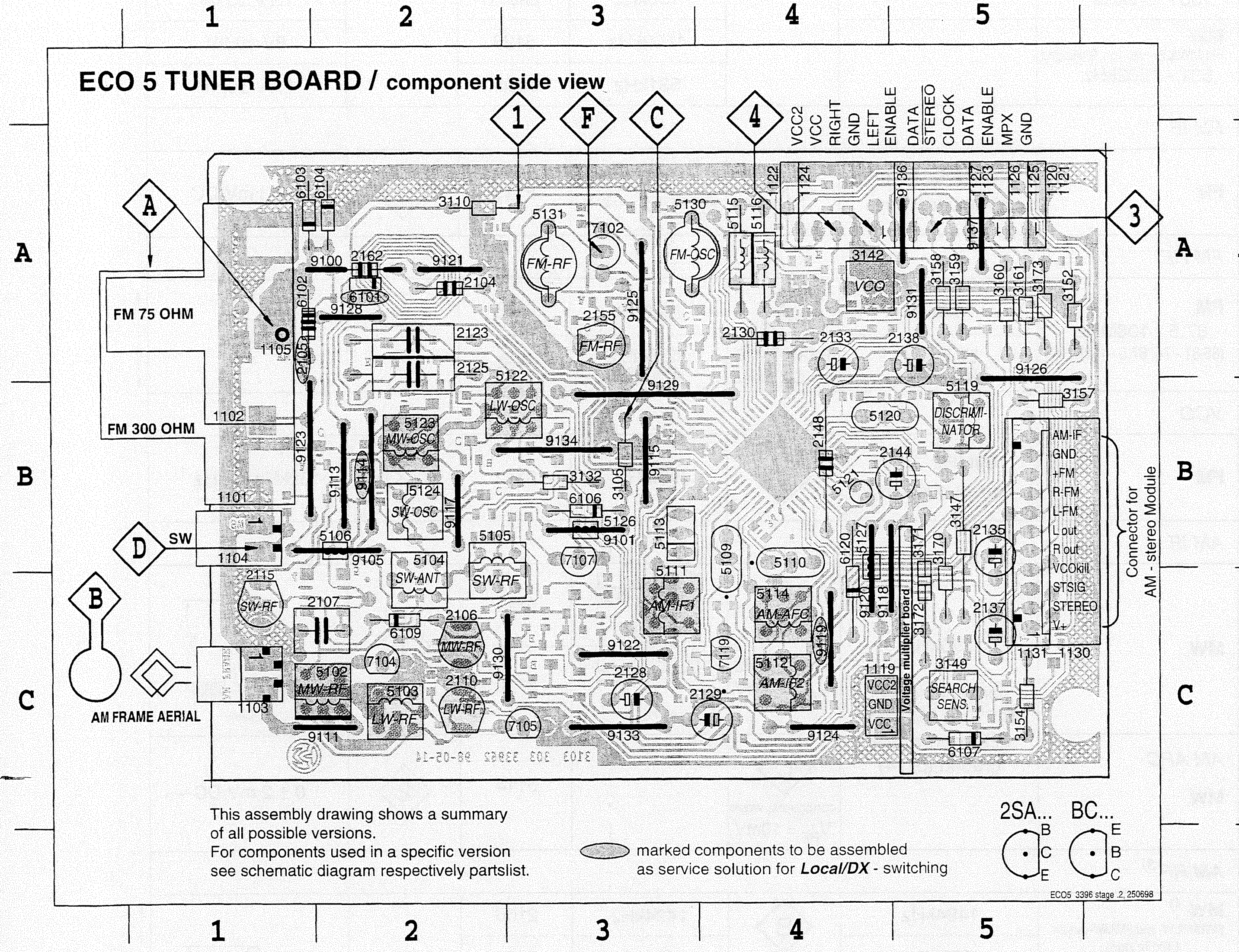
TUNER BOARD
ECO 5 systems



1101
(1102)
FM
A
V_Loop
FM-RF
V_StabA
10,7 MHz
V_StabB
10,7 MHz
Discr.
5
buffer ampl.
RDS
(MPX)
LF filter
VCO
Vcc1
Vdd
Vcc2
Vcc
1124
4
right
left
1
3
39
37
35
33
18
10
11
9
43
FM frontend
FM Mixer
IF1
IF2
FM Det.
Stereo Decoder
right 15
left 14
stereo 24
FM-Osc.
V_Loop
5
FM Osc.
Pre-scaler
Multi-plexer
RADIO IC
TEA 5757T
Version
3
stereo
1126
1121
4
6
AM-Osc.
AM-FRAME AERIAL
V_Loop
6
AM Osc.
clock 27
clock
data 28
data
enable 29
enable
1103
AM-RF
2
AM Frontend
AM Mixer
AM IF
AM Det.
CONTROL
1
RDS
(MPX)
1
V_Loop
C
B
AGC
P1 31
programmable output ports
P0 30
1
8
V_Loop
Charge pump
V_StabA 38
V_StabB 34
AFC
Reference Oscillator
MW/LW
AM-RF,
AM-Osc.
23
7
22
40
41
36
44
32
19
AFC -
AFC +
20
25
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kHz
2
75kHz
V_StabA
V_StabB
V_StabB
ECO5 sys., 110297

1101	A1	2106	C2	2137	C5	3149	C5	3173	A5	5114	C4	5130	A3	7104	C2	9117	B2	9129	B3
1102	A1	2107	C2	2138	A5	3152	A5	5102	C2	5115	A4	5131	A3	7105	C3	9118	B4	9130	C3
1103	C1	2110	C2	2144	B5	3154	C5	5103	C2	5116	A4	6101	A2	7107	B3	9119	C4	9131	A5
1104	B1	2115	C1	2148	B4	3157	B5	5104	C2	5119	B5	6102	A1	7119	C4	9120	B4	9133	C3
1105	A1	2123	A2	2155	A3	3158	A5	5105	B2	5120	B4	6103	A1	9100	A2	9121	A2	9134	B3
1119	C5	2125	A2	2162	A2	3159	A5	5106	B2	5121	B4	6104	A2	9101	B3	9122	C3	9136	A5
1120	A5	2128	C3	3105	B3	3160	A5	5109	B4	5122	B3	6106	B3	9105	B2	9123	B1	9137	A5
1130	B5	2129	C4	3110	A2	3161	A5	5110	B4	5123	B2	6107	C5	9111	C2	9124	C4		
1131	B5	2130	A4	3132	B3	3170	C5	5111	C3	5124	B2	6109	C2	9113	B2	9125	A3		
2104	A2	2133	A4	3142	A4	3171	C5	5112	C4	5126	B3	6120	C4	9114	B2	9126	B5		
2105	A1	2135	B5	3147	B5	3172	C5	5113	B3	5127	B4	7102	A3	9115	B3	9128	A2		

ECO 5 TUNER BOARD / component side view

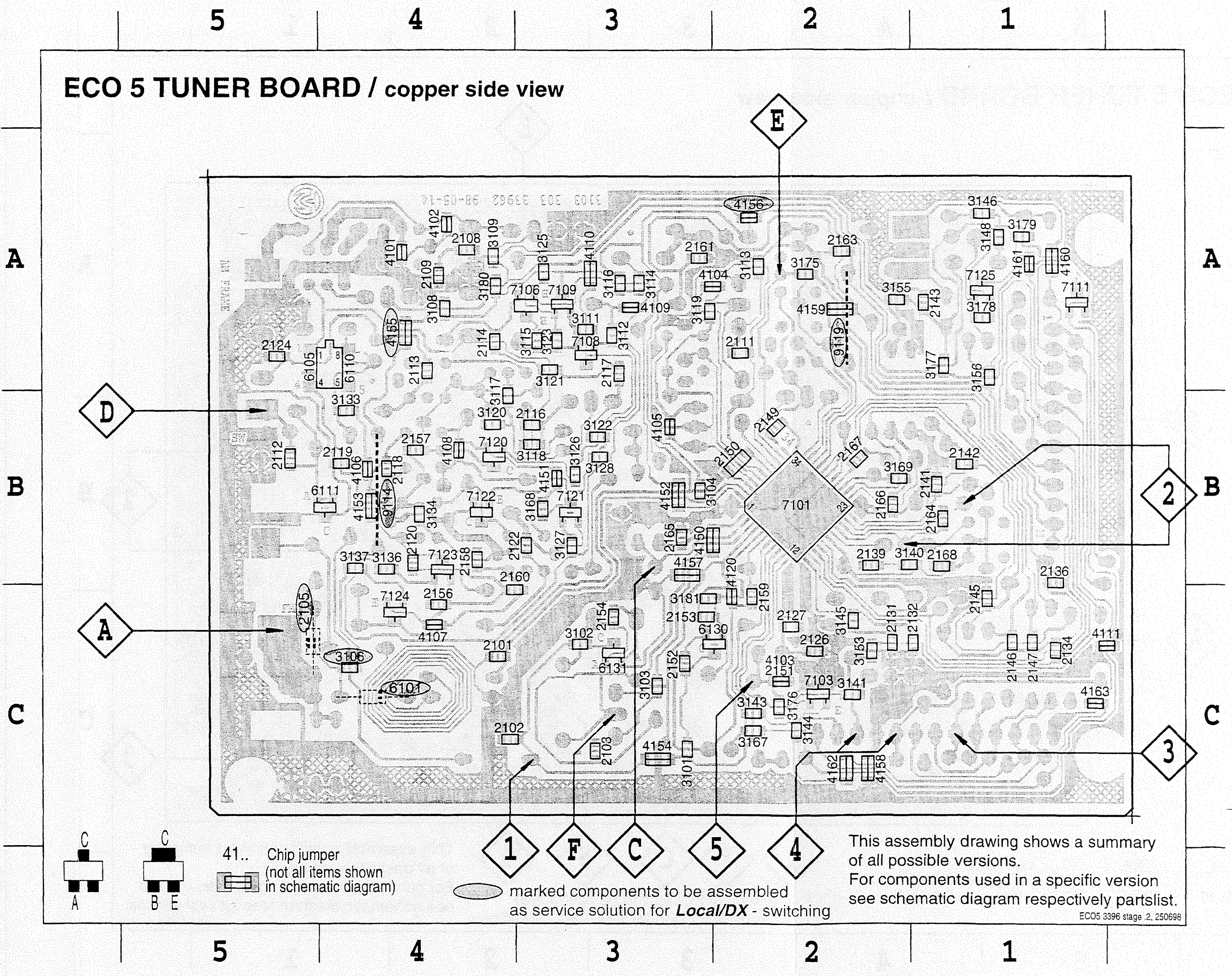

1
2
3
4
5
A
B
C
1
F
C
4
3
A
D
B
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
FM 75 OHM
FM 300 OHM
SW
AM FRAME AERIAL
FM-RF
FM-OSC
VCO
LW-OSC
MW-OSC
SW-OSC
SW-ANT
SW-RF
MW-RF
LW-RF
AM-IF1
AM-AFC
AM-IF2
DISCRIMI-NATOR
SEARCH SENS.
VCC2
GND
VCC
Voltage multiplier board
AM-IF
GND
+FM
R-FM
L-FM
L out
R out
VCOkill
STSIG
STEREO
V+
Connector for AM - stereo Module
2SA...
BC...
B
C
E
E
B
C
ECO5 3396 stage 2, 250698

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for ***Local/DX*** - switching

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4105	B3	4153	B4	6105	A4	7120	B4
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4106	B4	4154	C3	6110	A4	7121	B3
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4107	C4	4155	A4	6111	B4	7122	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4108	B4	4156	A2	6130	C2	7123	B4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4109	A3	4157	B3	6131	C3	7124	C4
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4110	A3	4158	C2	7101	B2	7125	A1
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	3181	C3	4111	C1	4159	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4101	A4	4120	C2	4160	A1	7106	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4102	A4	4150	B2	4161	A1	7108	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4103	C2	4151	B3	4162	C1	7109	A3		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4104	A2	4152	B3	4163	C1	7111	A1		

ECO 5 TUNER BOARD / copper side view


5
4
3
2
1
A
B
C
E
D
A
2
3
1
F
C
5
4
C
C
A
B E
41..
Chip jumper
(not all items shown in schematic diagram)
ECO5 3396 stage 2, 250698

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for ***Local/DX*** - switching

TUNER ADJ

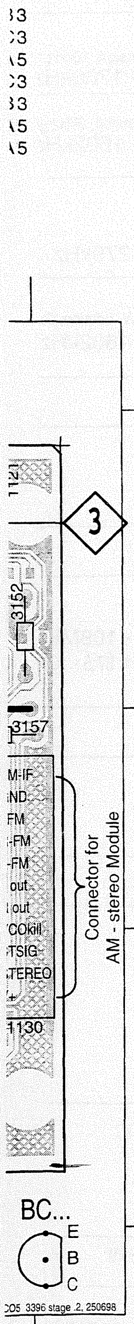
Waverange
VARICAP ALIG
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108
MW FM/AM-version, 10kHz 530 - 1700kHz
FM/MW-version, 9kHz g 531 - 1602kHz
LW 153 - 279kHz
MW FM/MW/LW- version, 9k 531 - 1602kHz
FM IF
FM
FM RF
FM 87.5 - 108MH (65.81 - 74, 87.5 - 108
VCO
FM
AM IF
MW
AM AFC **MW**
AM RF [3]
MW [4] FM/MW/LW- and FM/MW- (9kHz grid) 531 - 1602kHz
LW
MW FM/AM-version, 10kHz 530 - 1700kHz

Use service test prog

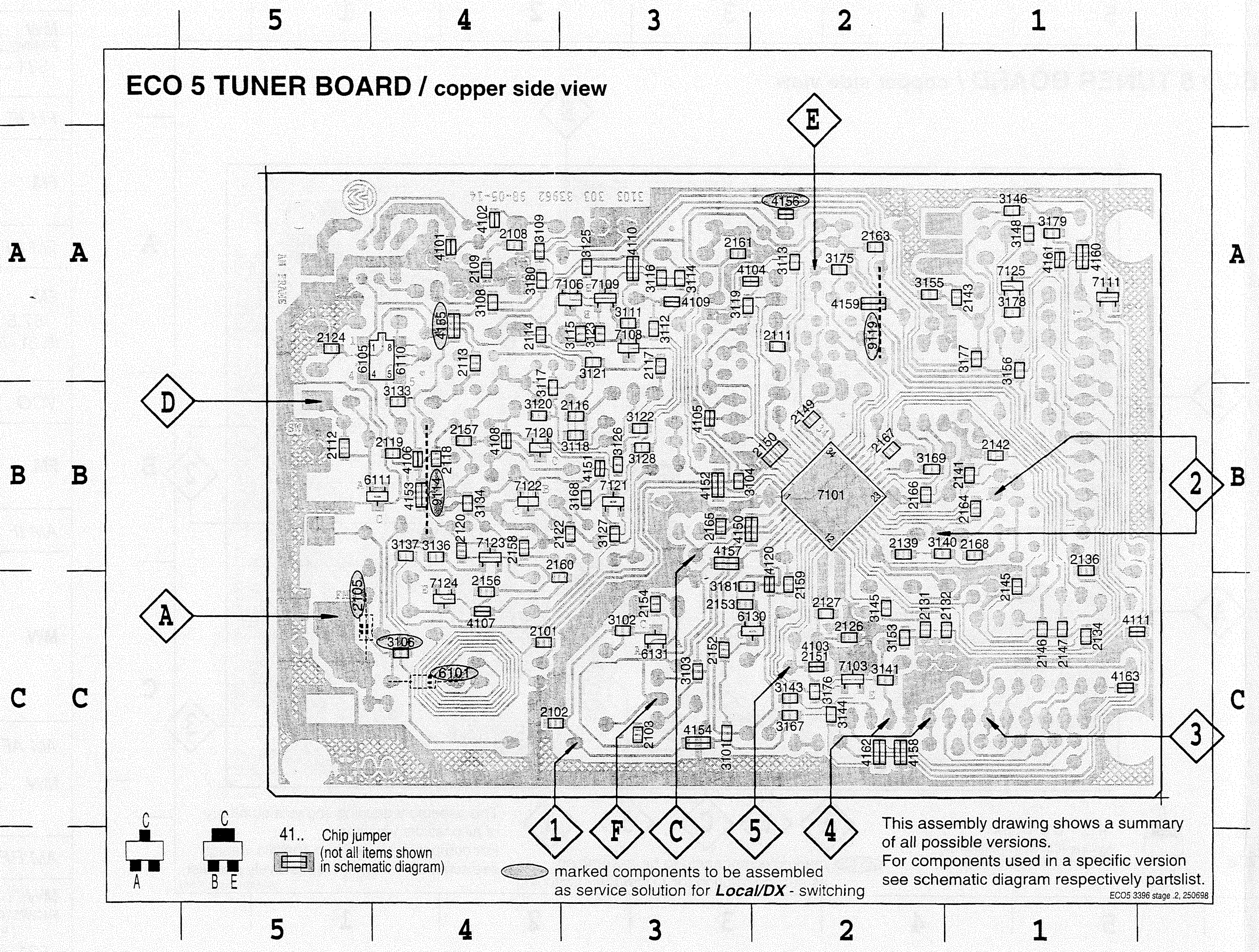
[1] If sensitivity of freq (input signal: stere

[3] For AM RF adjustm

↕ Repeat



2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4105	B3	4153	B4	6105	A4	7120	B4
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4106	B4	4154	C3	6110	A4	7121	B3
2103	C3	2120	B4	2142	B1	2156	C4	2168	B1	3114	A3	3126	B3	3145	C2	3177	A1	4107	C4	4155	A4	6111	B4	7122	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4108	B4	4156	A2	6130	C2	7123	B4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4109	A3	4157	B3	6131	C3	7124	C4
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4110	A3	4158	C2	7101	B2	7125	A1
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	3181	C3	4111	C1	4159	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4101	A4	4120	C2	4160	A1	7106	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4102	A4	4150	B2	4161	A1	7108	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4103	C2	4151	B3	4162	C1	7109	A3		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4104	A2	4152	B3	4163	C1	7111	A1		



ECO 5 TUNER BOARD / copper side view

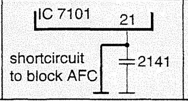
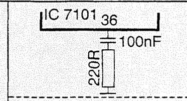
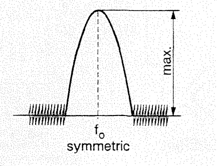
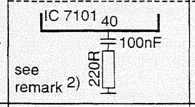
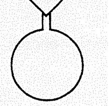
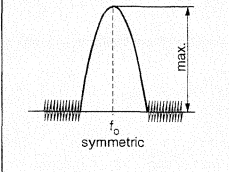
41.. Chip jumper (not all items shown in schematic diagram)

marked components to be assembled as service solution for *Local/DX* - switching

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

ECO5 3396 stage 2, 250698

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW			279kHz	5122		8V ±0.2V
153 - 279kHz			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F	 IC 7101 21 shortcircuit to block AFC 2141	5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX ↕
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV	 IC 7101 36 100nF 220R	5111	4	 max. f_o symmetric
			 IC 7101 40 100nF 220R see remark [2]	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B 	1494kHz	2106	4	 max. f_o symmetric ↕
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		↕
	560kHz	Δf = ±30kHz V_{RF} as low as possible	560kHz	5102		

ECO5, discr. coil, 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

---

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

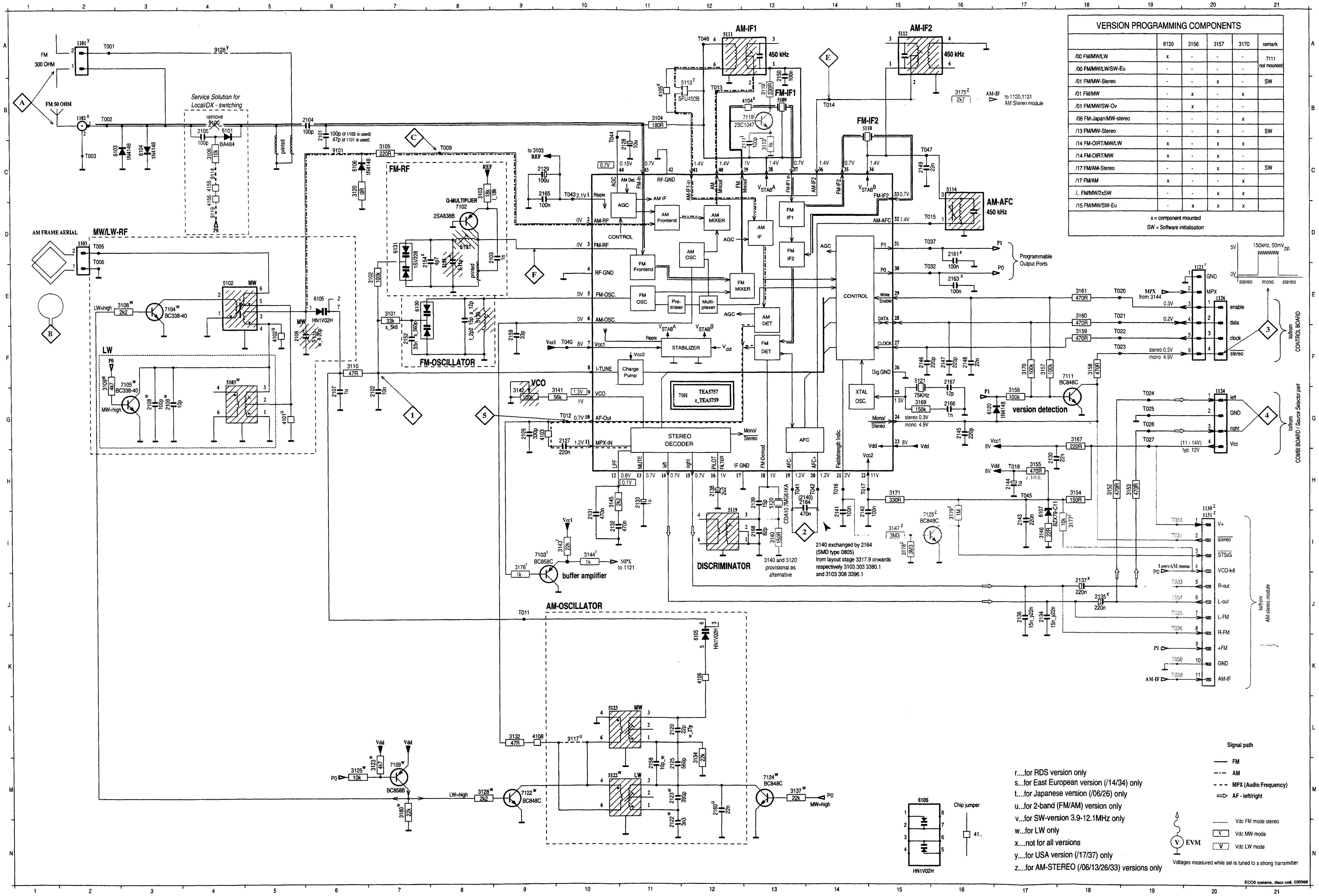
[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

TUNER BOARD ECO5 / Systems


FM 300 OHM
FM 50 OHM
AM FRAME AERIAL
MW/LW-RF
LW
Service Solution for Local/DX - switching
remove 9100
FM-RF
Q-MULTIPLIER 7102
FM-OSCILLATOR
VCO
AM-IF1
450 kHz
FM-IF1
AM-IF2
FM-IF2
AM-AFC 450 kHz
7101 TEA5757 z_TEA5759
AGC
AM Frontend
AM MIXER
AM IF
FM IF1
FM IF2
FM Frontend
FM OSC
AM OSC
Pre-scaler
Multi-plexer
FM MIXER
AM DET
FM DET
STABILIZER
Charge Pump
STEREO DECODER
CONTROL
XTAL OSC.
AFC
Programmable Output Ports
version detection
buffer amplifier
DISCRIMINATOR
3140 and 5120 provisional as alternative
AM-OSCILLATOR
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
to/from AM-stereo module
5V 150kHz, 50mVpp 0V stereo mono stereo
Chip jumper
HN1V02H
EVM
ECO5 systems, discr.coil, 030998

2140 exchanged by 2164
(SMD type 0805)
from layout stage 3317.9 onwards
respectively 3103 303 3380.1
and 3103 308 3396.1

VERSION PROGRAMMING COMPONENTS	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path

—	FM
-·-	AM
- - -	MPX (Audio Frequency)
⇨	AF - left/right

....	Vdc FM mode stereo
V	Vdc MW mode
V	Vdc LW mode

Voltages measured while set is tuned to a strong transmitter

1101	A 1
1102	B 2
1103	D 2
1121	E20
1124	G20
1126	E20
1130	I20
1131	I20
2101	C 6
2102	G 7
2103	D 9
2104	B 6
2106	F 5
2107	G 6
2108	G 3
2109	G 3
2111	C13
2120	L11
2122	N11
2123	M11
2125	M11
2126	G 9
2127	G10
2128	C11
2129	C 9
2130	H17
2131	I10
2132	I10
2133	H11
2134	J17
2135	J18
2136	J17
2137	J18
2138	H12
2139	H13
2140	H14
2141	H14
2142	H14
2143	I17
2144	H17
2145	G16
2146	F15
2147	F16
2148	F16
2149	C15
2150	B13
2152	F 7
2153	E 8
2154	E 7
2155	D 8
2158	M11
2159	F 9
2160	M12
2161	D16
2163	E16
2164	H14
2165	C 9
2166	G16
2167	F16
2168	I 13
3101	E 7
3102	E 7
3103	C 8
3104	B11
3105	C 7
3108	E 3
3109	F 2
3110	F 6
3113	C13
3119	B13
3120	C 6
3123	M 7
3125	M 6
3128	M 8
3132	L 9
3134	M12
3137	M13
3140	I13
3141	G10
3142	G 9
3143	I10
3144	I10
3145	H10
3146	I17
3147	I15
3152	H18
3153	H19
3154	H18
3155	H17
3156	G17
3157	F17
3158	F18
3159	F18
3160	E18
3161	E18
3167	G18
3169	G15
3170	F17
3171	H15
3175	B16
3176	J 9
3177	I18
3178	I15
3179	I16
3180	M7
4101	G 5
4102	F 5
4103	G 9
4104	B13
4105	B11
4106	K12
4108	L 9
5102	E 4
5103	F 4
5109	B13
5110	B14
5111	A13
5112	A15
5113	B12
5114	C16
5119	I 12
5120	H13
5121	F15
5122	M11
5123	L11
5130	E 8
5131	D 8
6103	C 2
6104	C 3
6105	K12
6105	E 6
6106	C 6
6107	H17
6120	G16
6130	E 7
6131	D 7
7101	G11
7102	D 8
7103	I 9
7104	E 3
7105	F 2
7109	M 7
7111	F18
7119	B13
7122	M 9
7124	M13
7125	I16
9100	B 4
9101	C 6
9117	L10
9128	A 4

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805 5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W 5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	
3176	4822 051 10102	1k 2% 0,25W	for RDS version
3180	4822 051 20223	22k 5% 0,1W	for LW version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

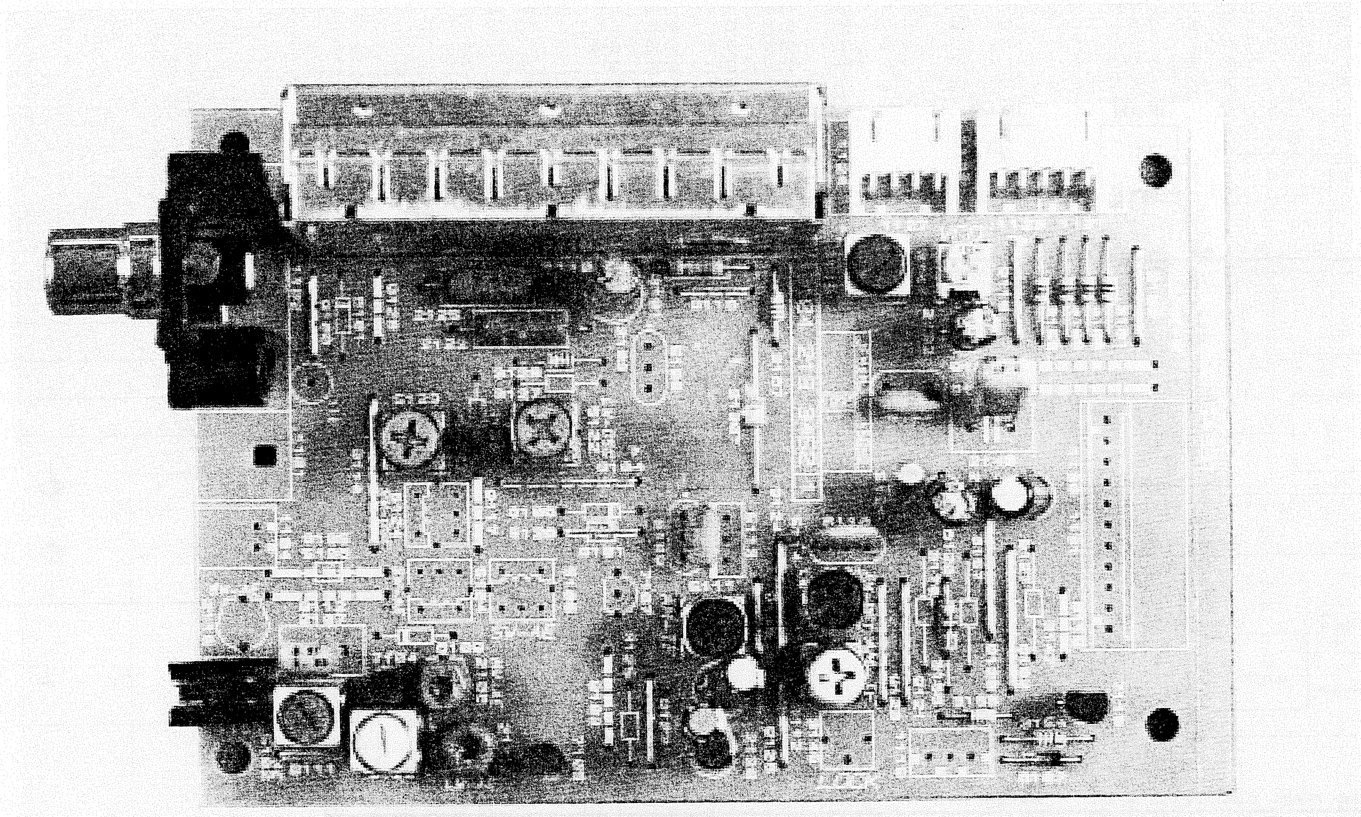
DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.



TUNER 95 BOARD

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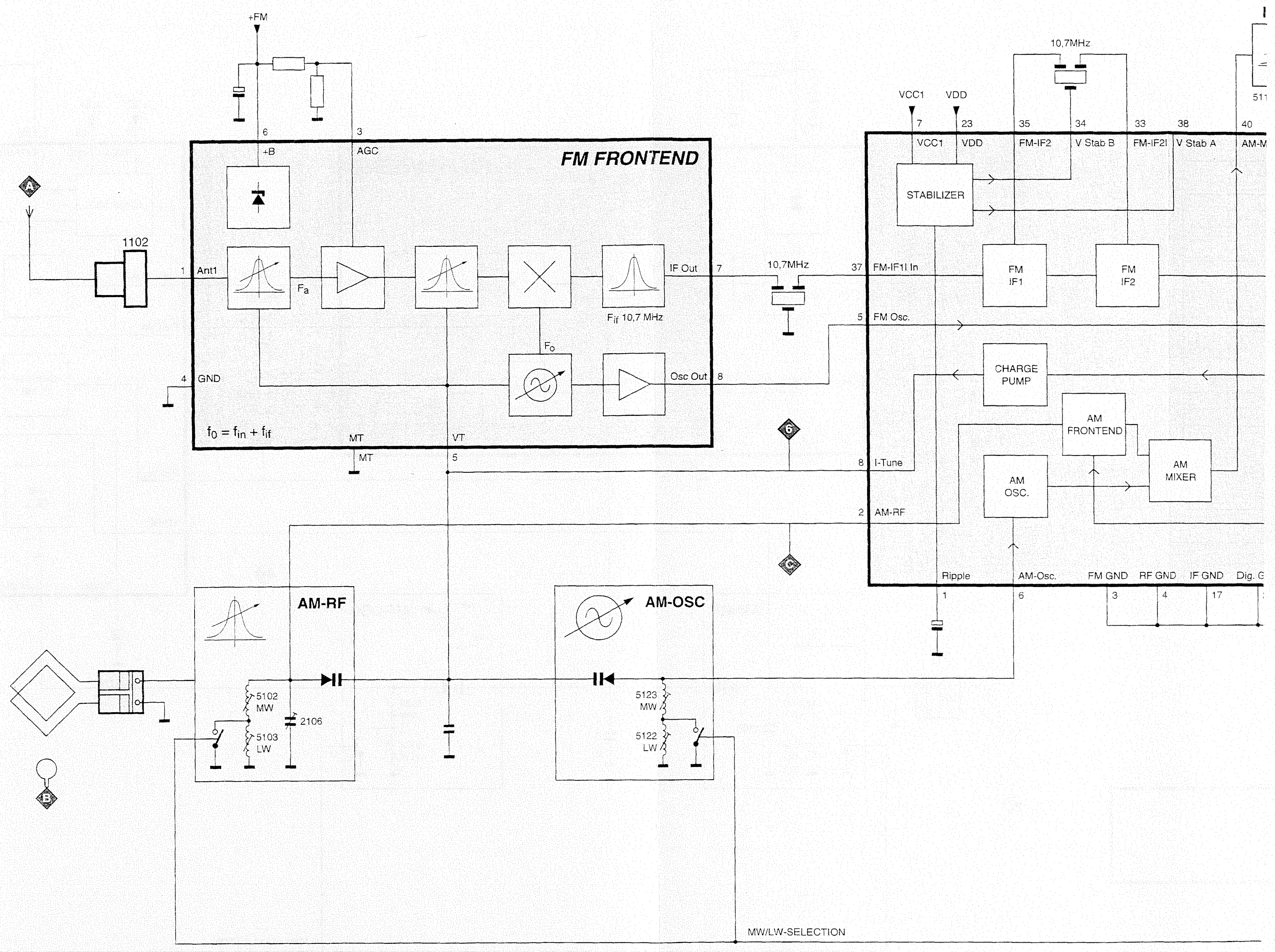
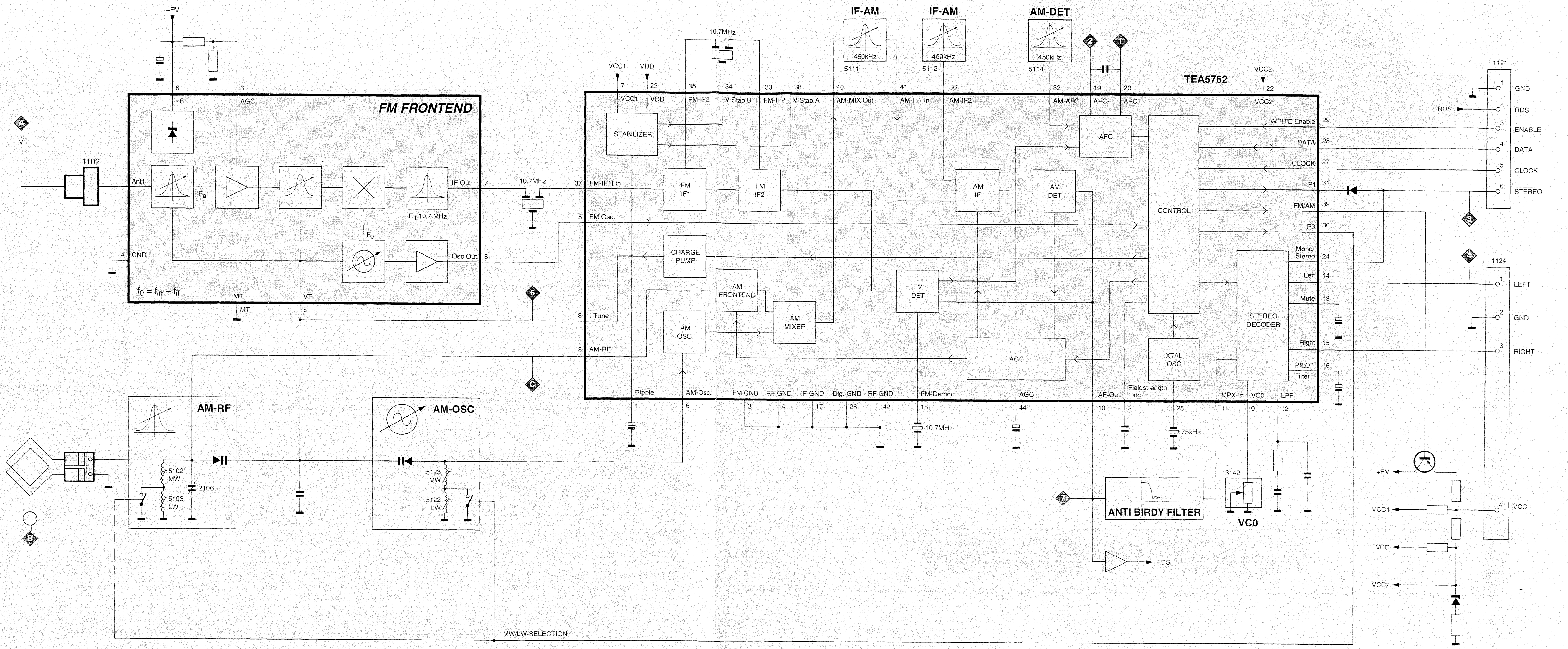
BLOCKDIAGRAM

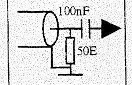


+FM
6
3
+B
AGC
FM FRONTEND
A
1102
1
Ant1
Fa
IF Out
7
Fif 10,7 MHz
Fo
4
GND
Osc Out
8
f0 = fin + fif
MT
VT
MT
5
10,7MHz
10,7MHz
VCC1
VDD
7
23
35
34
33
38
40
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
STABILIZER
37
FM-IF1I In
FM IF1
FM IF2
5
FM Osc.
CHARGE PUMP
AM FRONTEND
8
I-Tune
AM MIXER
AM OSC.
2
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
IF GND
1
6
3
4
17
AM-RF
AM-OSC
5102 MW
2106
5103 LW
5123 MW
5122 LW
B
C
MW/LW-SELECTION

BLOCKDIAGRAM


+FM
6
3
+B
AGC
FM FRONTEND
1102
1
Ant1
Fa
IF Out
7
Fif 10,7 MHz
Fo
4
GND
Osc Out
8
f0 = fin + fif
MT
VT
MT
5
10,7MHz
10,7MHz
IF-AM
450kHz
5111
IF-AM
450kHz
5112
AM-DET
450kHz
5114
2
1
TEA5762
VCC1
VDD
7
23
35
34
33
38
40
41
36
32
19
20
VCC2
22
VCC1
VDD
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
VCC2
STABILIZER
AFC
CONTROL
37
FM-IF1I In
FM IF1
FM IF2
AM IF
AM DET
5
FM Osc.
CHARGE PUMP
AM FRONTEND
AM MIXER
FM DET
8
I-Tune
AM OSC.
2
AM-RF
AGC
XTAL OSC
STEREO DECODER
WRITE Enable
29
DATA
28
CLOCK
27
P1
31
FM/AM
39
P0
30
Mono/ Stereo
24
Left
14
Mute
13
Right
15
PILOT
16
Filter
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
RF GND
FM-Demod
AGC
AF-Out
Fieldstrength Indc.
MPX-In
VC0
LPF
1
6
3
4
17
26
42
18
10,7MHz
44
10
21
25
75kHz
11
9
12
6
C
A
AM-RF
AM-OSC
5102
MW
5103
LW
2106
5123
MW
5122
LW
B
MW/LW-SELECTION
7
ANTI BIRDY FILTER
3142
VC0
RDS
1121
1
GND
RDS
2
RDS
3
ENABLE
4
DATA
5
CLOCK
6
STEREO
3
4
1124
1
LEFT
2
GND
3
RIGHT
+FM
VCC1
4
VCC
VDD
VCC2

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	◇6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave *short pin 21 (IC7101) to ground*	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal		MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave	◇C		5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

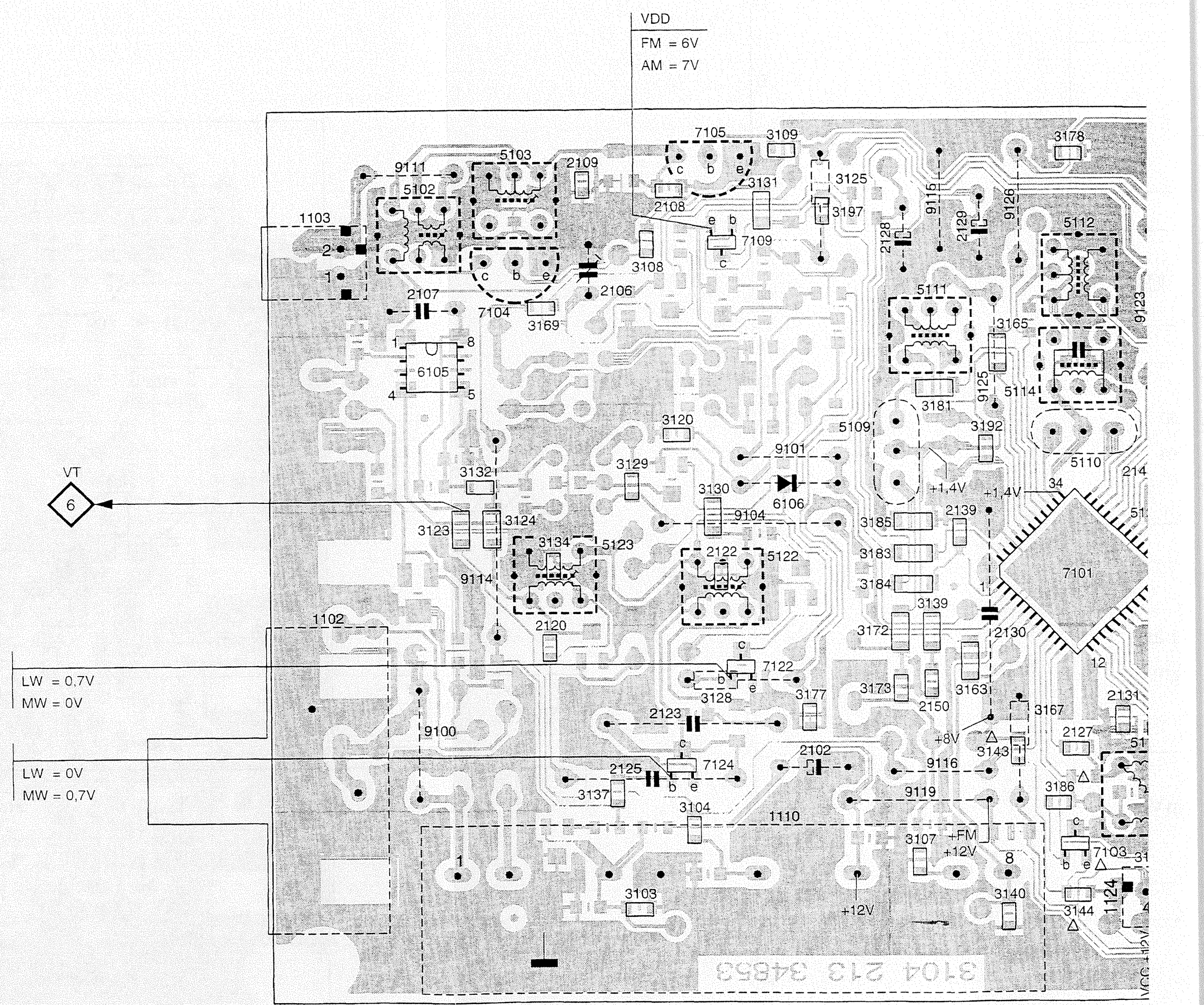
adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

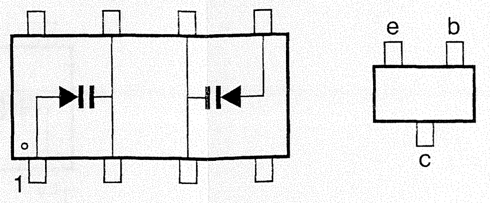
↕ repeat

1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9	31	
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7	31	
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D8	3178	B8	31	
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8	51	
1124	H9	2122	E6	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7	51	
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7	51	
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7	51	
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8	51	

TUNER 95 bis Combi: Copper side view


VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
1103
1102
9111
5102
5103
2109
7105
3109
3131
3125
3197
3178
5112
2107
7104
3169
2106
3108
7109
2108
6105
5111
3165
5114
3181
3192
5110
3120
3129
3130
9101
6106
9104
3132
3123
3124
3134
5123
2122
5122
3185
2139
3183
3184
7101
9114
2120
3139
3172
2130
7122
3128
3177
3173
2150
3163
3167
2131
2123
9100
2125
7124
2102
9116
3143
2127
3137
3104
1110
9119
3186
3107
+FM
+12V
7103
3103
3140
3144
1124
+12V
+1,4V
+8V
5109
2128
2129
9115
9126
9125
9123
7100

IC 6105



TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

meter

V

2V

V

2V

V

nV

kHz

on

m

l and

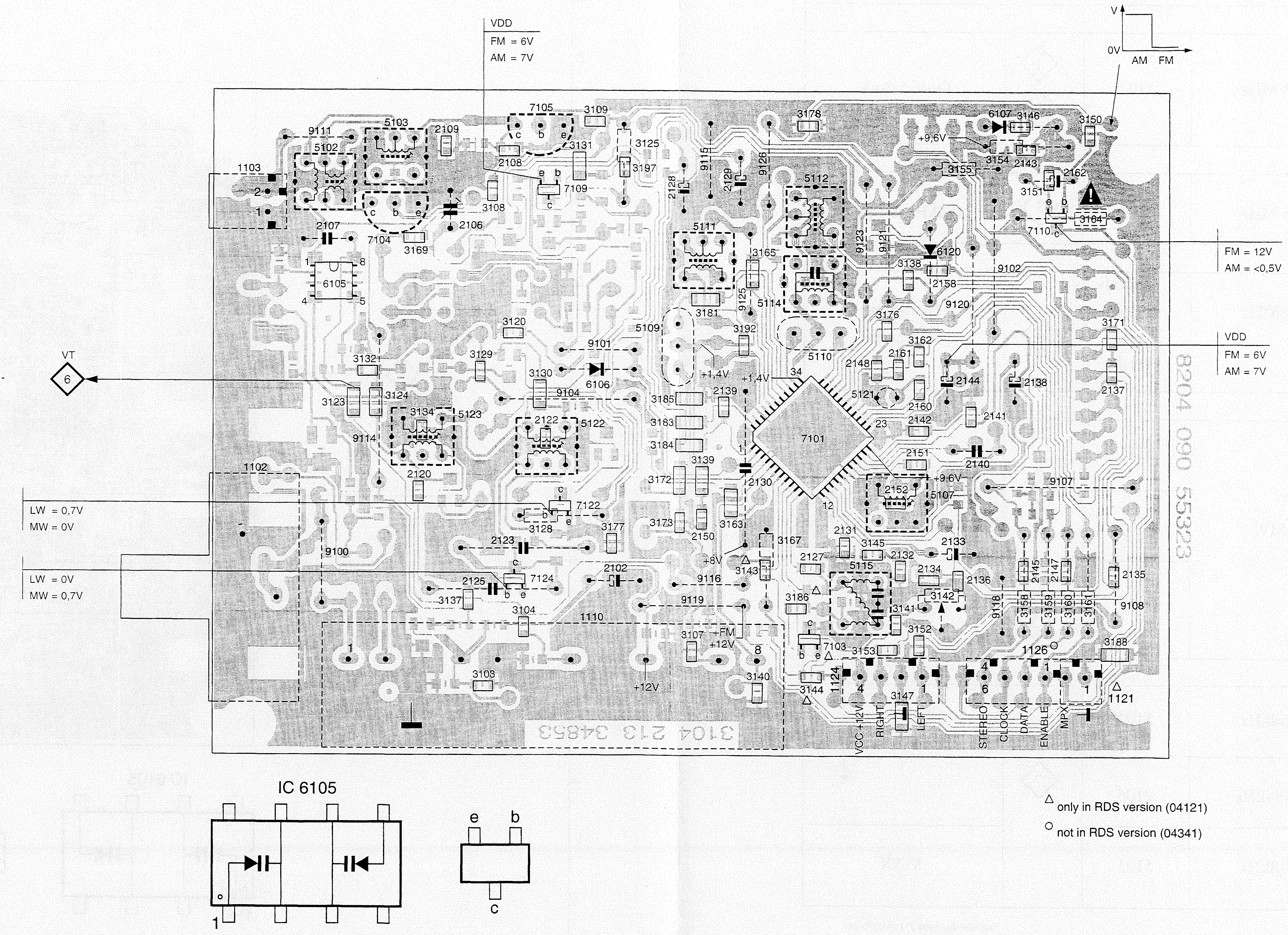
ght

mV

21/04341

1102	F4	2107	C4	2128	C7	2136	G10	2144	E10	2160	E9	3120	D6	3132	E5	3143	G8	3153	G9	3163	F8	3176	D9	3188	G11	5111	C8	6106	E7	7110	D11	9108	G11	9121	D9
1103	C4	2108	C6	2129	C8	2137	E11	2145	G11	2161	E9	3123	E4	3134	E5	3144	H9	3154	C10	3164	C11	3177	F7	3192	D8	5112	C9	6107	B10	7122	F7	9111	C4	9123	D9
1110	G7	2109	C5	2130	F8	2138	E10	2147	G11	2162	C11	3124	E5	3137	G5	3145	F9	3155	C10	3165	D8	3178	B8	3197	C7	5114	D8	6120	D10	7124	G6	9114	E5	9125	D8
1121	H11	2120	F5	2131	F9	2139	E8	2148	E9	3103	H6	3125	C7	3138	D9	3146	B10	3158	G11	3167	F8	3181	D8	5102	C4	5115	G9	7101	E9	9100	F4	9115	C8	9126	C8
1124	H9	2122	E6	2132	F9	2140	F10	2150	F8	3104	G6	3128	F6	3139	F8	3147	H9	3159	G11	3169	D5	3183	E7	5103	C5	5121	E9	7103	G9	9101	E7	9116	G8		
1126	G10	2123	F6	2133	F10	2141	E10	2151	F9	3107	G7	3129	E6	3140	H8	3150	C11	3160	G11	3171	D11	3184	E7	5107	F10	5122	E7	7104	D5	9102	D10	9118	G10		
2102	G7	2125	G6	2134	G10	2142	E9	2152	F9	3108	C6	3130	E6	3141	G9	3151	C10	3161	G11	3172	F7	3185	E7	5109	D7	5123	E5	7105	B6	9104	E6	9119	G7		
2106	C5	2127	F9	2135	G11	2143	C10	2158	D10	3109	B7	3131	C6	3142	G10	3152	G9	3162	D9	3173	F7	3186	G8	5110	E9	6105	D4	7109	C6	9107	F11	9120	D10		

TUNER 95 bis Combi: Copper side view

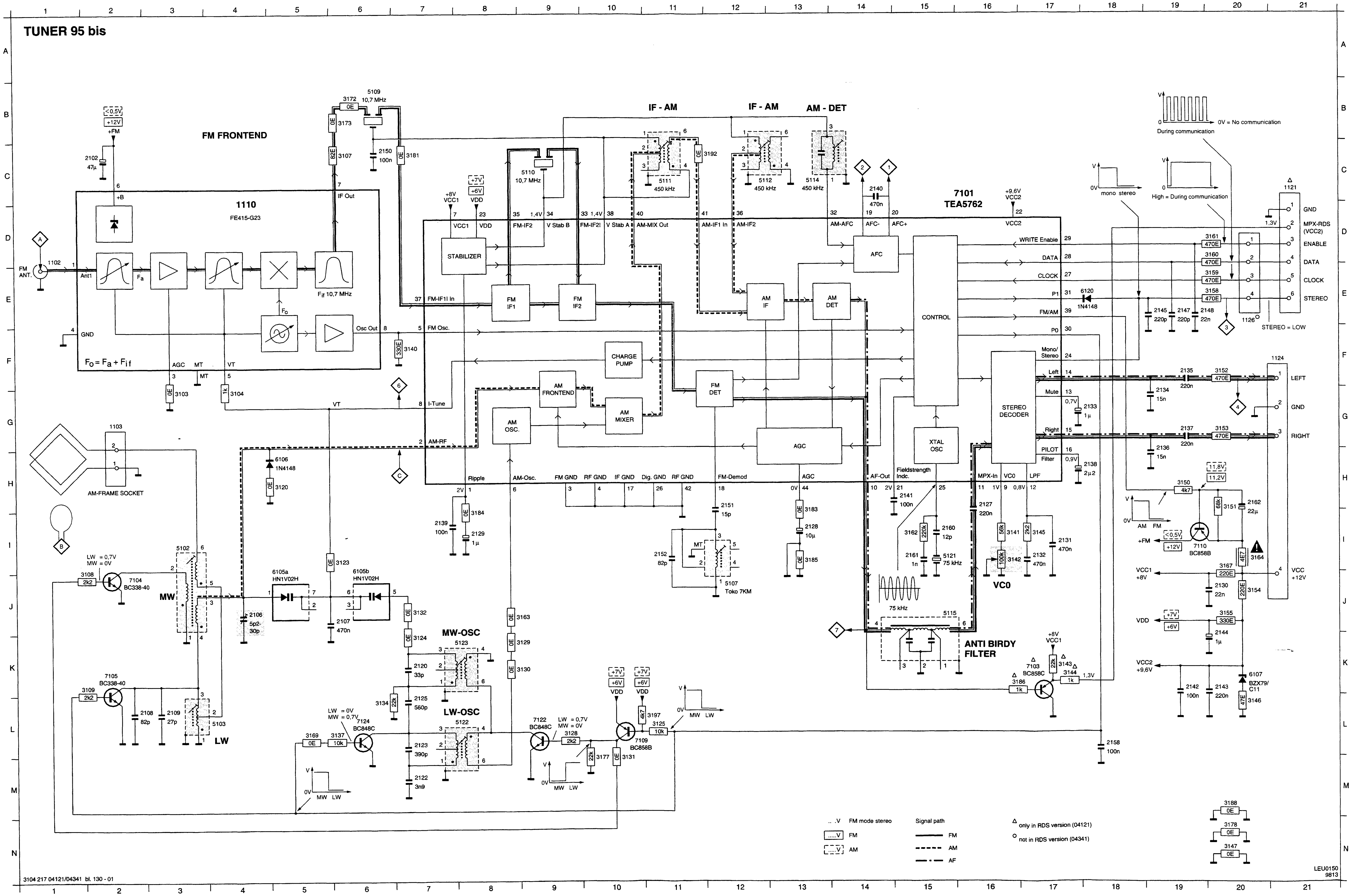

VDD
FM = 6V
AM = 7V
VT
6
LW = 0,7V
MW = 0V
LW = 0V
MW = 0,7V
V
0V
AM FM
FM = 12V
AM = <0,5V
VDD
FM = 6V
AM = 7V
+9,6V
+1,4V
+8V
+12V
+FM
7101
3104 213 34853
8204 090 55323
VCC +12V
RIGHT
LEFT
STEREO
CLOCK
DATA
ENABLE
MPX
IC 6105
1
e
b
c
△ only in RDS version (04121)
○ not in RDS version (04341)

TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

LEU0149
9813

1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2139	I7
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3120	H5
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3147	N20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3178	N20
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6106	H5
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis


FM FRONTEND
1110
FE415-G23
FM ANT.
1102
Ant1
GND
IF Out
Osc Out
$F_o = F_a + F_{if}$
F_{if} 10,7 MHz
AGC
MT
VT
5109
10,7 MHz
5110
10,7 MHz
IF - AM
IF - AM
AM - DET
5111
450 kHz
5112
450 kHz
5114
450 kHz
7101
TEA5762
STABILIZER
FM IF1
FM IF2
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AM IF
AM DET
AFC
AGC
CONTROL
XTAL OSC
STEREO DECODER
VCO
ANTI BIRDY FILTER
5115
75 kHz
MW-OSC
5123
LW-OSC
5122
MW
LW
5102
5103
AM-FRAME SOCKET
1103
7104
BC338-40
7105
BC338-40
6105a
HN1V02H
6105b
HN1V02H
7124
BC848C
7122
BC848C
7109
BC858B
7103
BC858C
7110
BC858B
6107
BZX79/C11
6120
1N4148
6106
1N4148
5107
Toko 7KM
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
STEREO = LOW
1124
LEFT
GND
RIGHT
VCC +12V
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/ Stereo
Left
Mute
Right
PILOT Filter
0V = No communication
During communication
High = During communication
mono stereo
.. .V FM mode stereo
FM
AM
Signal path
FM
AM
AF
only in RDS version (04121)
not in RDS version (04341)
3104 217 04121/04341 bl. 130 - 01
LEU0150
9813

ELECTRICAL PARTS LIST - TUNER 95 BOARD

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3120	4822 051 20008	0R Jumper 0805
3123	4822 051 10008	0R Jumper 1206
3124	4822 051 10008	0R Jumper 1206
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R Jumper 1206
3131	4822 051 10008	0R Jumper 1206
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R Jumper 1206
3140	4822 051 20331	330R 5% 0,1W
3141	4822 117 11148	56k 1% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3147	4822 051 10008	0R Jumper 1206
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 117 13579	220k 1% 0,1W
3163	4822 051 10008	0R Jumper 1206
3164	4822 052 10478 ⚠	4R7 5% 0,33W
3165	4822 051 10008	0R Jumper 1206
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R Jumper 1206
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3178	4822 051 10008	0R Jumper 1206
3181	4822 051 10008	0R Jumper 1206
3183	4822 051 10008	0R Jumper 1206
3184	4822 051 10008	0R Jumper 1206
3185	4822 051 10008	0R Jumper 1206
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R Jumper 1206
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial
5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz
5114	4822 157 70302	AM_IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHZ
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note : Only the parts mentioned in this list are normal service spare parts.

ETF6-FE TAPE MODULE

(Non-Dolby Version)

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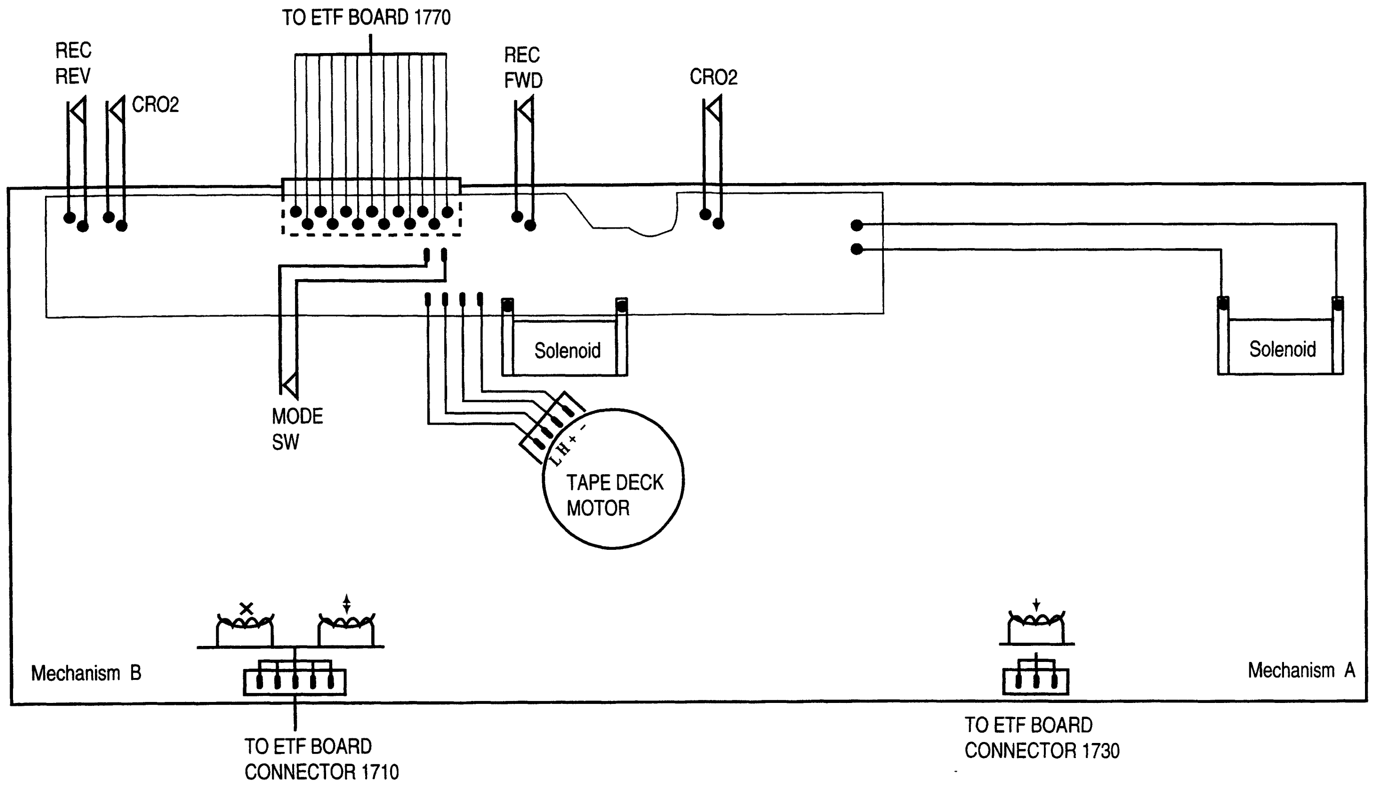
Tapedeck wiring (Double deck)


TO ETF BOARD 1770
REC REV
CRO2
REC FWD
CRO2
Solenoid
Solenoid
MODE SW
TAPE DECK MOTOR
L H + -
Mechanism B
Mechanism A
TO ETF BOARD CONNECTOR 1710
TO ETF BOARD CONNECTOR 1730

OPTIONS / VARIANTS TABLE

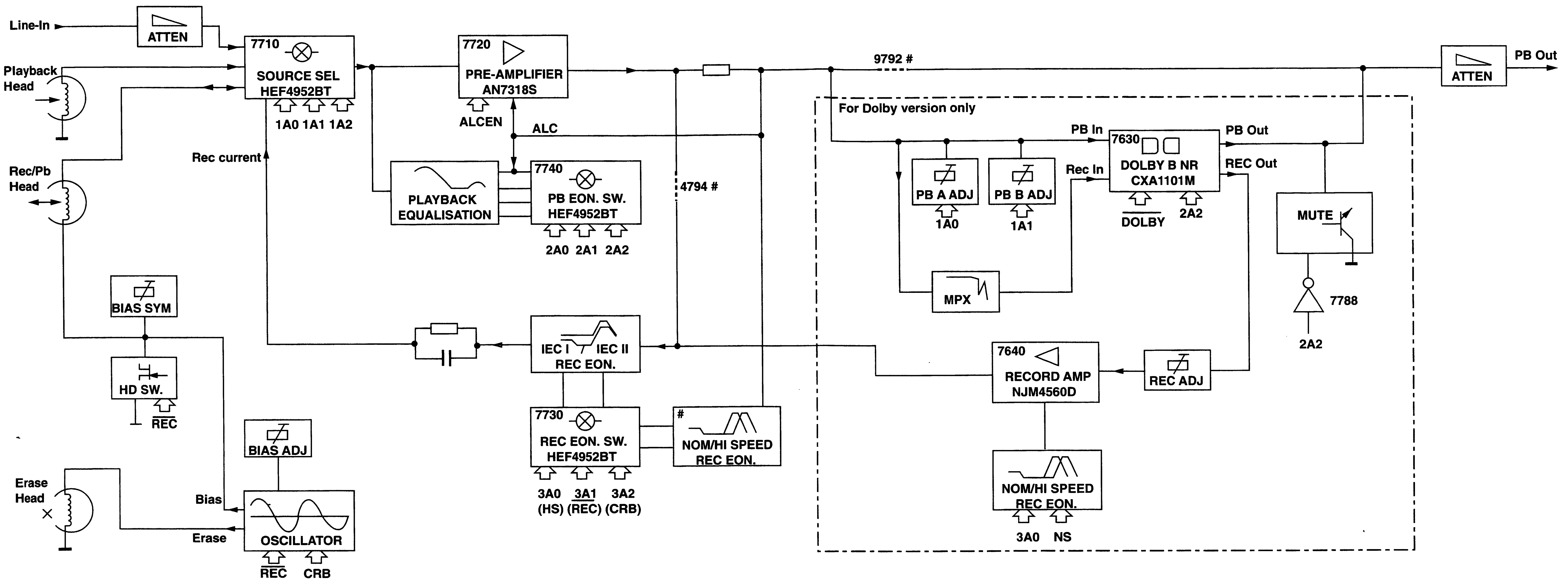
MODULE	ETF6-FE	
VARIANT	**1**	**2**
NAME	**ND/DD/FR**	**ND/DD/FF**
Deck configuration	double	double
Autoreverse	yes (B)	no
Auto-replay	no	yes (B)
Motor configuration	single	single
Auto tape type selection	yes	yes
Dolby B type Noise Reduction	no	no
19 kHz pilot suppression	no	no
High speed dubbing	yes	yes

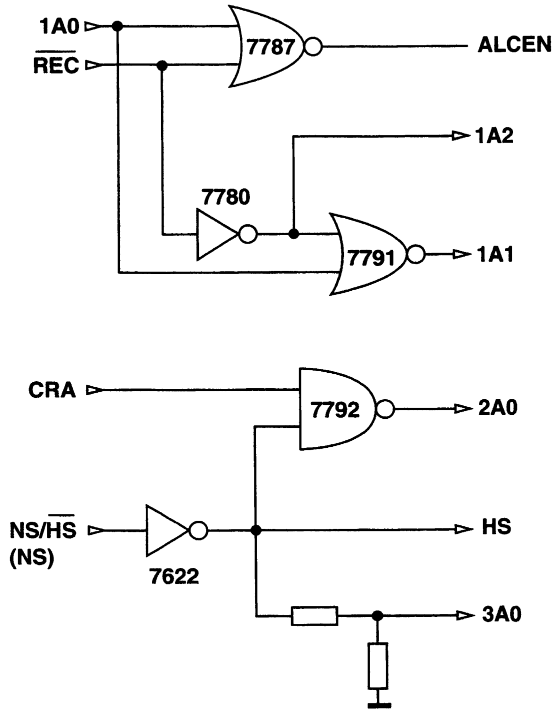
DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

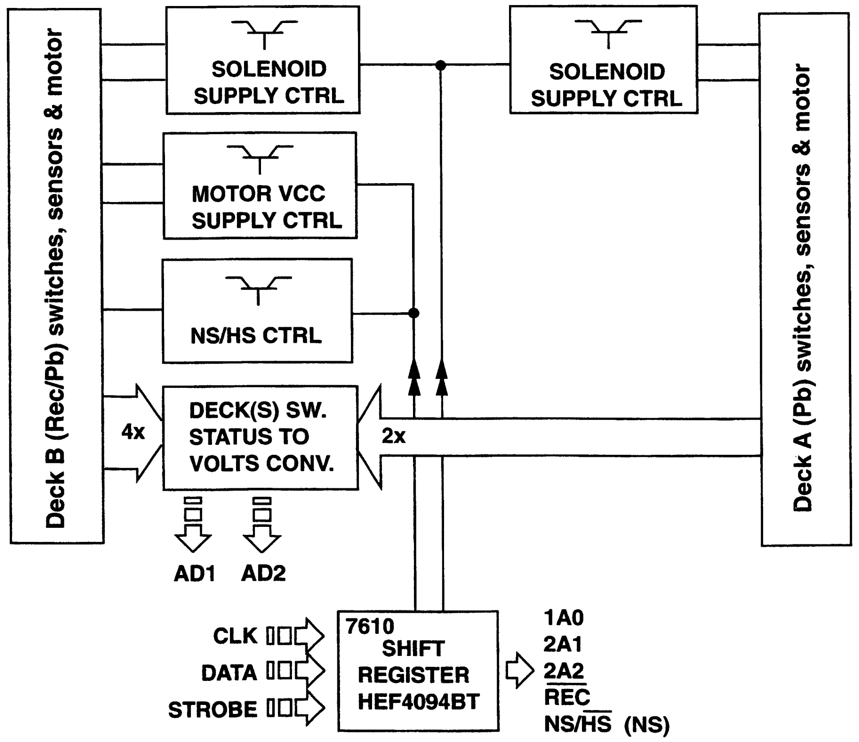
Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
1760	-	-
1770	use	use
3723	12k	15k
3724	12k	15k
3743	1k2	1k
3744	1k2	1k
3769	12k	8k2
3772	4k7	5k6
3774	10k	8k2

BLOCK DIAGRAM


Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
Rec current
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
PLAYBACK EQUALISATION
7740
PB EON. SW.
HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
ATTEN
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
1A0
PB B ADJ
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
BIAS SYM
HD SW.
REC
IEC I
IEC II
REC EON.
7730
REC EON. SW.
HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED
REC EON.
7640
RECORD AMP
NJM4560D
REC ADJ
NOM/HI SPEED
REC EON.
3A0 NS
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors & motor
AD1 AD2
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯▷ MicroProcessor Control / Communication lines

▷ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)
   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

15. IC7630 (CXA1551M)
    IC7630 (CXA1101M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and out to the AF Board via connector 1701.

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   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

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11. Bias Symm (For Dolby only)
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12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

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    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

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    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 INTERCONNECTION TO AF BOARD

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) in
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 INTERCONNECTION TO AF BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 DECK B HEADS CONNECTON *(For ETF6... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 DECK B HEADS CONNECTON *(For ETF5... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740 DECK B CONTROL INTERFACE *(For ETF5... Double Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	H	H pin for motor	
○	10	L	L pin for motor	

CONNECTOR 1750 DECK A CONTROL INTERFAC *(For ETF5... Double Deck only)*

○	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	2	PHOTO A	Photo sensor output (tape movement indication)	
○	3	SOL A	Solenoid supply	
○	4	Vcc	Deck/Motor supply	
○	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	6	GND M	Deck/Motor ground	

CONNECTOR 1760 DECK B CONTROL INTERFACE *(For Single Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	

CONNECTOR 1770 DECK A & B CONTROL INTERFACE *(For ETF6... only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	L	L pin for motor	
○	10	H	H pin for motor	
○	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	12	SOL A	Solenoid supply for deck A	
○	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM ELECTRONICS

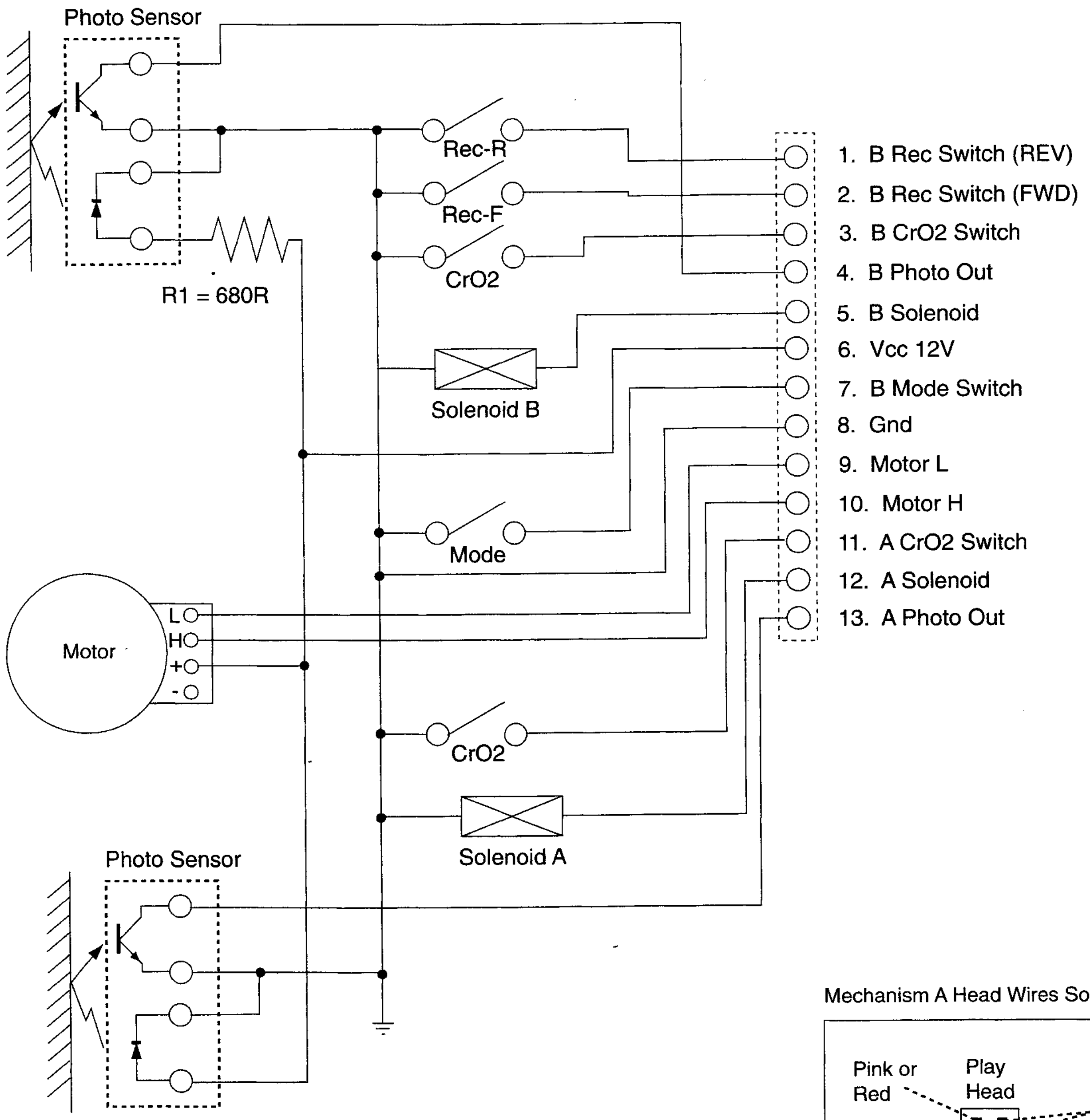
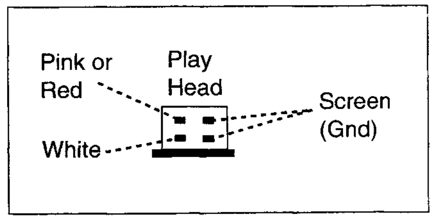
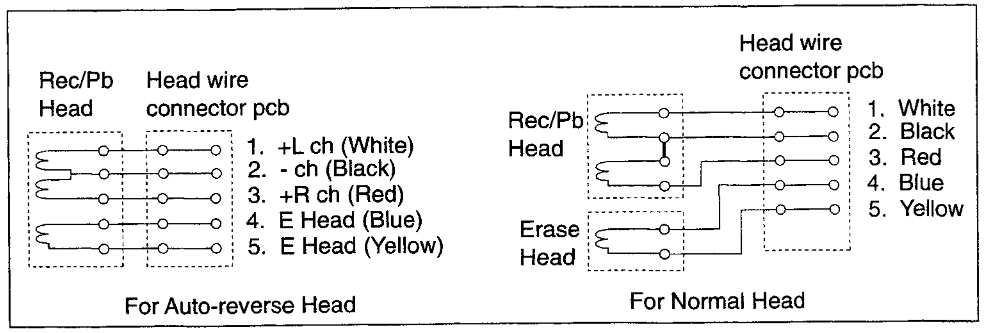


Photo Sensor
Rec-R
Rec-F
CrO2
R1 = 680R
Solenoid B
Mode
Motor
L
H
+
-
CrO2
Solenoid A
Photo Sensor
1. B Rec Switch (REV)
2. B Rec Switch (FWD)
3. B CrO2 Switch
4. B Photo Out
5. B Solenoid
6. Vcc 12V
7. B Mode Switch
8. Gnd
9. Motor L
10. Motor H
11. A CrO2 Switch
12. A Solenoid
13. A Photo Out

Mechanism A Head Wires Soldering


Pink or Red
Play Head
Screen (Gnd)
White

Mechanism B Head Wires Soldering


Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. - ch (Black)
3. +R ch (Red)
4. E Head (Blue)
5. E Head (Yellow)
For Auto-reverse Head
Rec/Pb Head
Erase Head
Head wire connector pcb
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	◇1 or ◇2 LEFT RIGHT	frequency counter	3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check	≤0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via ◇3 or ◇4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	◇1 or ◇2 LEFT RIGHT	THD-meter	check	≤3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high, increase bias and re-meaure

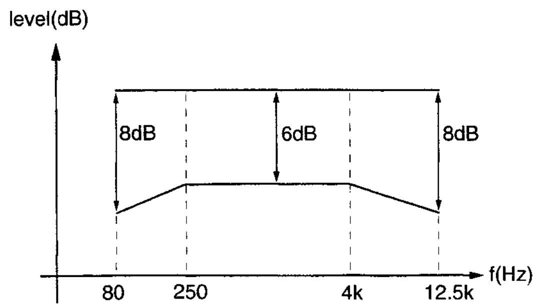


figure. 1

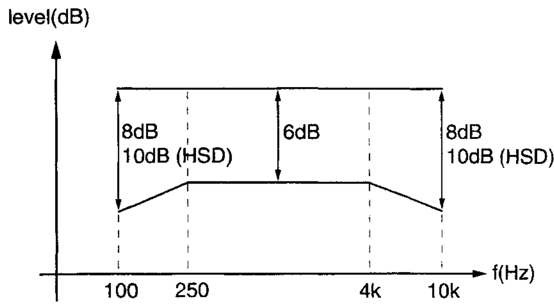
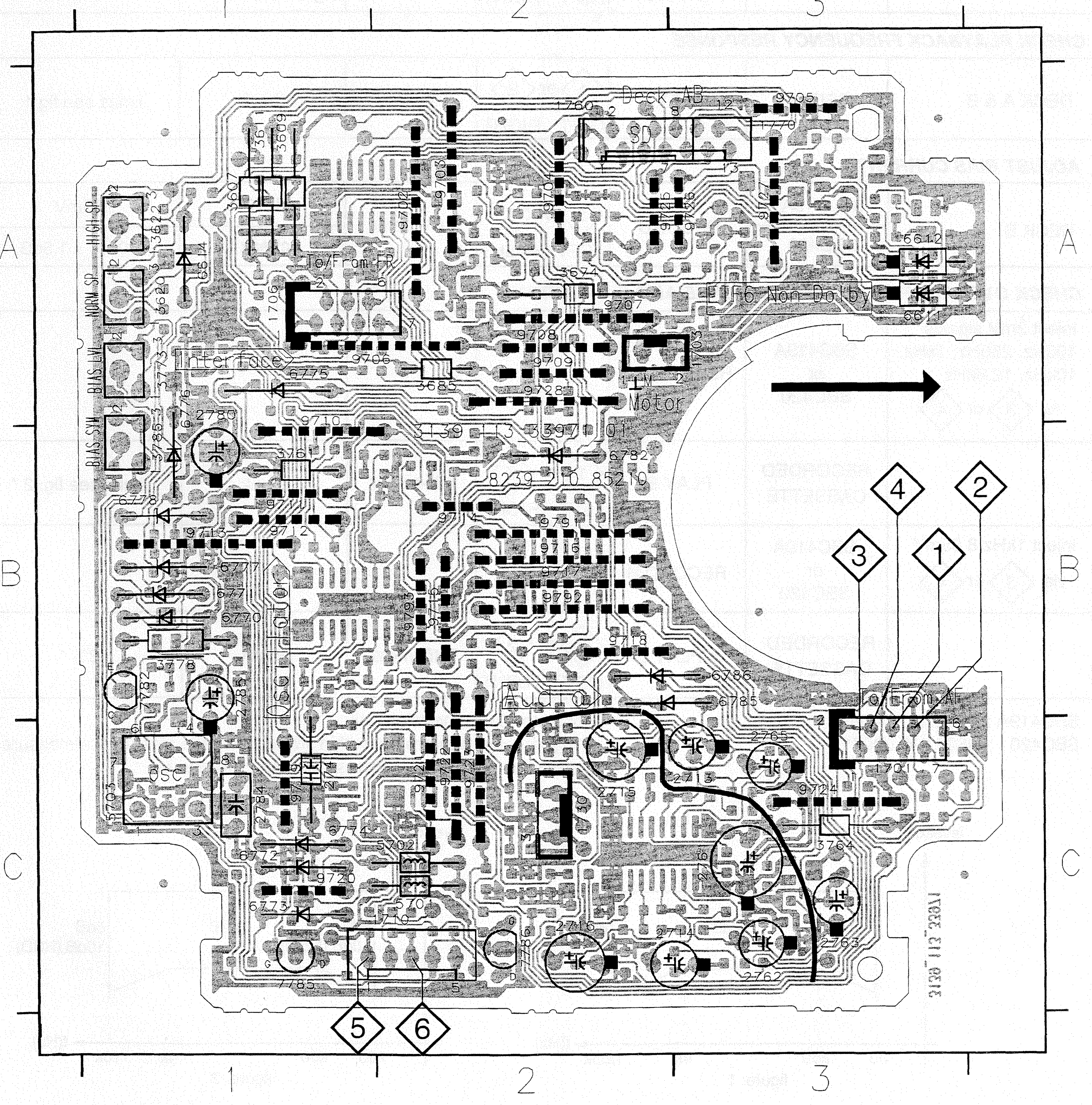


figure. 2

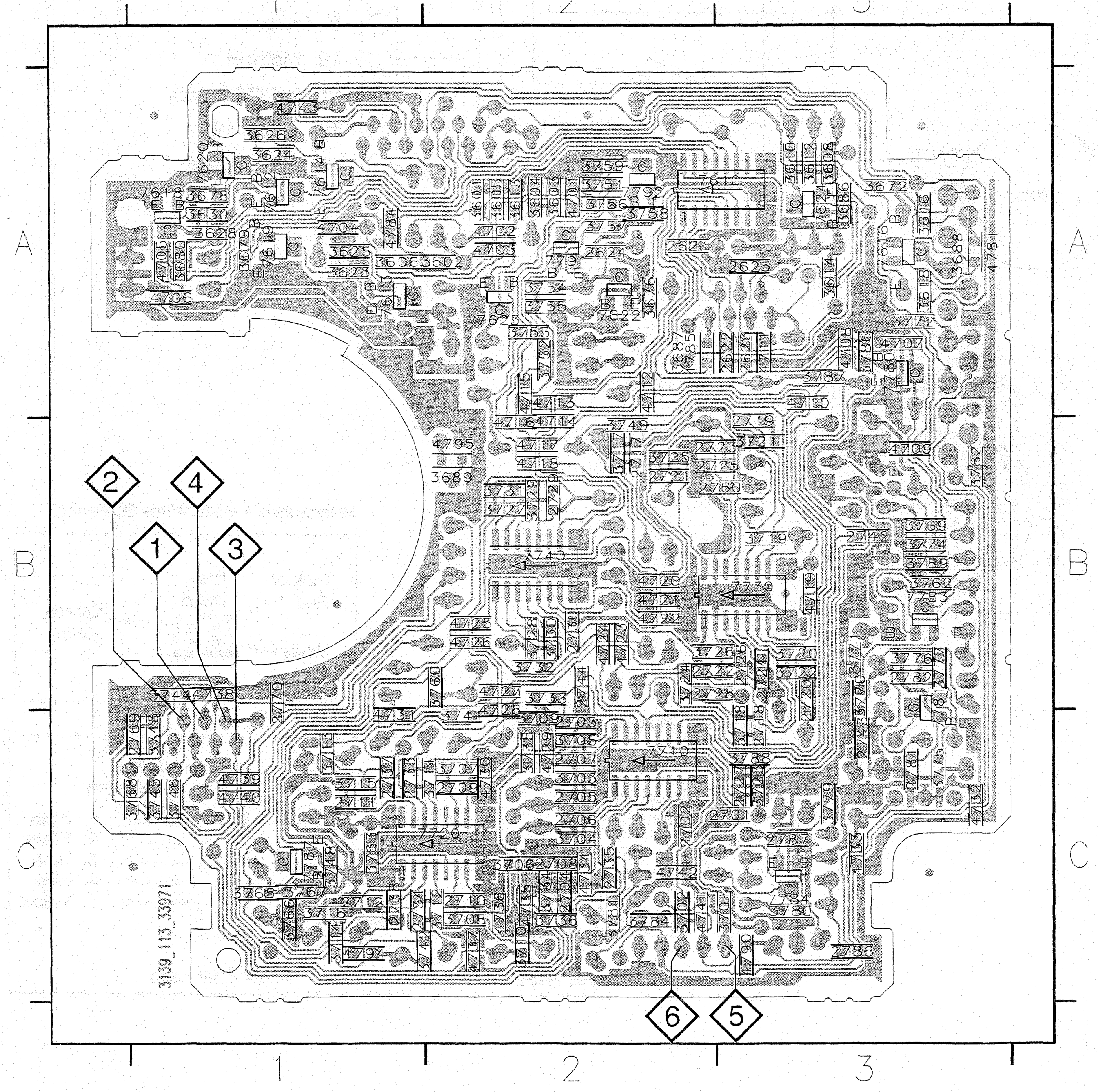
COMPONENT LAYOUT

1701	C3	2716	C2	3609	A1	3785	B1	6773	C1	7785	C1	9710	A1	9720	C1	9792	B2
1703	A3	2741	C1	3611	A1	5701	C2	6774	C1	7786	C2	9711	B1	9721	C2	9793	B2
1706	A1	2761	C3	3620	A1	5702	C2	6775	A1	9702	A2	9712	B1	9722	C2		
1710	C2	2762	C3	3622	A1	5703	C1	6776	A1	9703	A2	9713	B1	9723	C2		
1730	C2	2763	C3	3674	A2	6611	A3	6777	B1	9704	A2	9714	B2	9724	C3		
1760	A2	2765	C3	3685	A2	6612	A3	6778	B1	9705	A3	9715	B2	9725	A2		
1770	A3	2780	A1	3761	B1	6614	A1	6782	B2	9706	A1	9716	B2	9726	A3		
2713	C3	2784	C1	3764	C3	6770	B1	6785	B3	9707	A2	9717	B2	9727	A3		
2714	C3	2785	B1	3773	A1	6771	B1	6786	B3	9708	A2	9718	B2	9728	A2		
2715	C2	3607	A1	3778	B1	6772	C1	7782	B1	9709	A2	9719	C1	9791	B2		

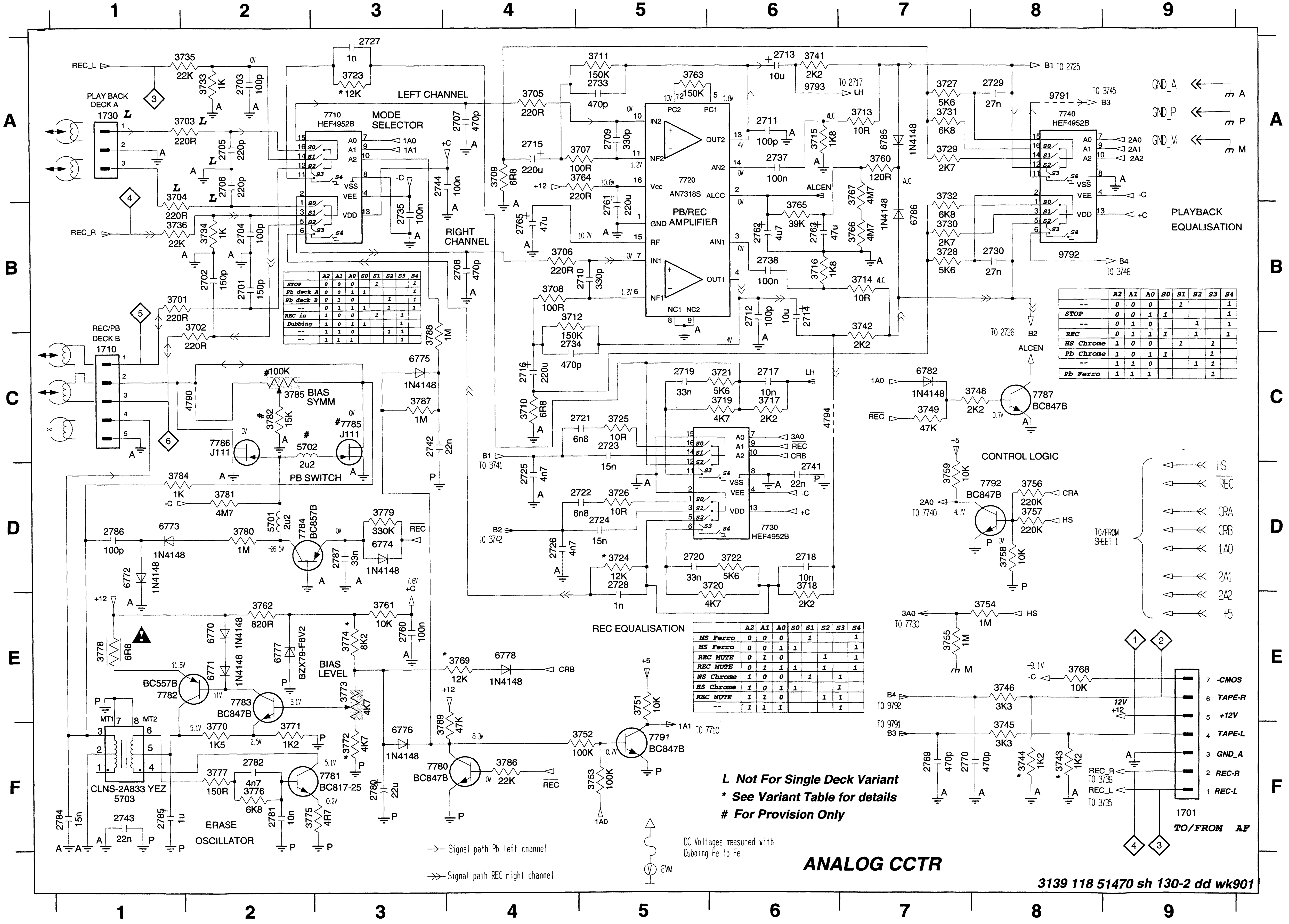


CHIP LAYOUT

2621	A2	2725	B3	3605	A2	3702	C2	3727	B2	3758	A2	3789	B3	4725	B2	7610	A3
2622	A3	2726	B3	3606	A1	3703	C2	3728	B2	3759	A2	4701	A2	4726	B2	7612	A1
2623	A3	2727	C3	3608	A3	3704	C2	3729	B2	3760	B2	4702	A2	4727	B2	7613	A1
2624	A2	2728	B2	3610	A3	3705	C2	3730	B2	3762	B3	4703	A2	4728	C2	7614	A1
2625	A3	2729	B2	3612	A3	3706	C2	3731	B2	3763	C1	4704	A1	4729	C2	7616	A3
2701	C3	2730	B2	3613	A2	3707	C2	3732	B2	3765	C1	4705	A1	4730	C2	7618	A1
2702	C2	2733	C1	3614	A3	3708	C2	3733	B2	3766	C1	4706	A1	4731	C1	7619	A1
2703	C2	2734	C1	3616	A3	3709	C2	3734	C2	3767	C1	4707	A3	4732	C3	7620	A1
2704	C2	2735	C2	3618	A3	3710	C2	3735	C2	3768	C1	4708	A3	4733	C3	7622	A2
2705	C2	2737	C1	3623	A1	3711	C2	3736	C2	3769	B3	4709	B3	4734	C2	7623	A2
2706	C2	2738	C1	3624	A1	3712	C2	3741	C2	3770	B3	4710	A3	4735	C2	7624	A3
2707	C2	2742	B3	3625	A1	3713	C1	3742	C1	3771	B3	4711	A3	4736	C2	7710	C2
2708	C2	2743	C3	3626	A1	3714	C1	3743	C1	3772	A3	4712	A2	4737	C2	7720	C2
2709	C2	2744	B2	3628	A1	3715	C1	3744	B1	3774	B3	4713	A2	4738	B1	7730	B3
2710	C2	2760	B3	3630	A1	3716	C1	3745	C1	3775	C3	4714	B2	4739	C1	7740	B2
2711	C1	2769	C1	3672	A3	3717	B2	3746	C1	3776	B3	4715	A2	4740	C1	7780	A3
2712	C1	2770	B1	3676	A2	3718	C3	3748	C1	3777	B3	4716	B2	4741	C2	7781	B3
2717	B2	2781	C3	3678	A1	3719	B3	3749	B2	3779	C3	4717	B2	4742	C2	7783	B3
2718	C3	2782	B3	3679	A1	3720	B3	3751	A2	3780	C3	4718	B2	4743	A1	7784	C3
2719	B3	2786	C3	3680	A1	3721	B3	3752	A2	3781	C2	4719	B3	4781	A3	7787	C1
2720	B3	2787	C3	3686	A3	3722	B3	3753	A2	3782	B3	4720	B2	4784	A1	7791	A2
2721	B2	3601	A2	3687	A2	3723	C3	3754	A2	3784	C2	4721	B2	4785	A2	7792	A2
2722	B2	3602	A2	3688	A3	3724	B2	3755	A2	3786	A3	4722	B2	4790	C3		
2723	B2	3603	A2	3689	B2	3725	B2	3756	A2	3787	A3	4723	B2	4794	C1		
2724	B3	3604	A2	3701	C3	3726	B2	3757	A2	3788	C3	4724	B2	4795	B2		



ANALOG CIRCUIT


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1710
7710 HEF4952B
MODE SELECTOR
LEFT CHANNEL
RIGHT CHANNEL
7720 AN7318S
PB/REC AMPLIFIER
IN2
NF2
Vcc
GND
RF
IN1
NF1
NC1
NC2
OUT2
AN2
ALCC
AIN1
OUT1
PC2
PC1
ALCEN
LH
B1 TO 2725
B2 TO 3742
B1 TO 3741
REC EQUALISATION
7730 HEF4952B
3A0
REC
CRB
7740 HEF4952B
PLAYBACK EQUALISATION
2A0
2A1
2A2
1A0
1A1
B3
B4 TO 3746
TO 2726 B2
ALCEN
7787 BC847B
CONTROL LOGIC
7792 BC847B
CRA
HS
TO/FROM SHEET 1
HS
REC
CRA
CRB
1A0
2A1
2A2
+5
GND_A
GND_P
GND_M
#100K
3785 BIAS SYMM
7786 J111
#7785 J111
5702 2u2
PB SWITCH
7784 BC857B
BIAS LEVEL
7782 BC557B
7783 BC847B
7781 BC817-25
7780 BC847B
7791 BC847B
CLNS-2A833 YEZ
5703
ERASE OSCILLATOR
BZX79-F8V2
1N4148
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
1701
TO/FROM AF
REC_R TO 3736
REC_L TO 3735
EVM

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

L Not For Single Deck Variant
***** **See Variant Table for details**
# For Provision Only

→ Signal path Pb left channel

→→ Signal path REC right channel

DC Voltages measured with Dubbing Fe to Fe

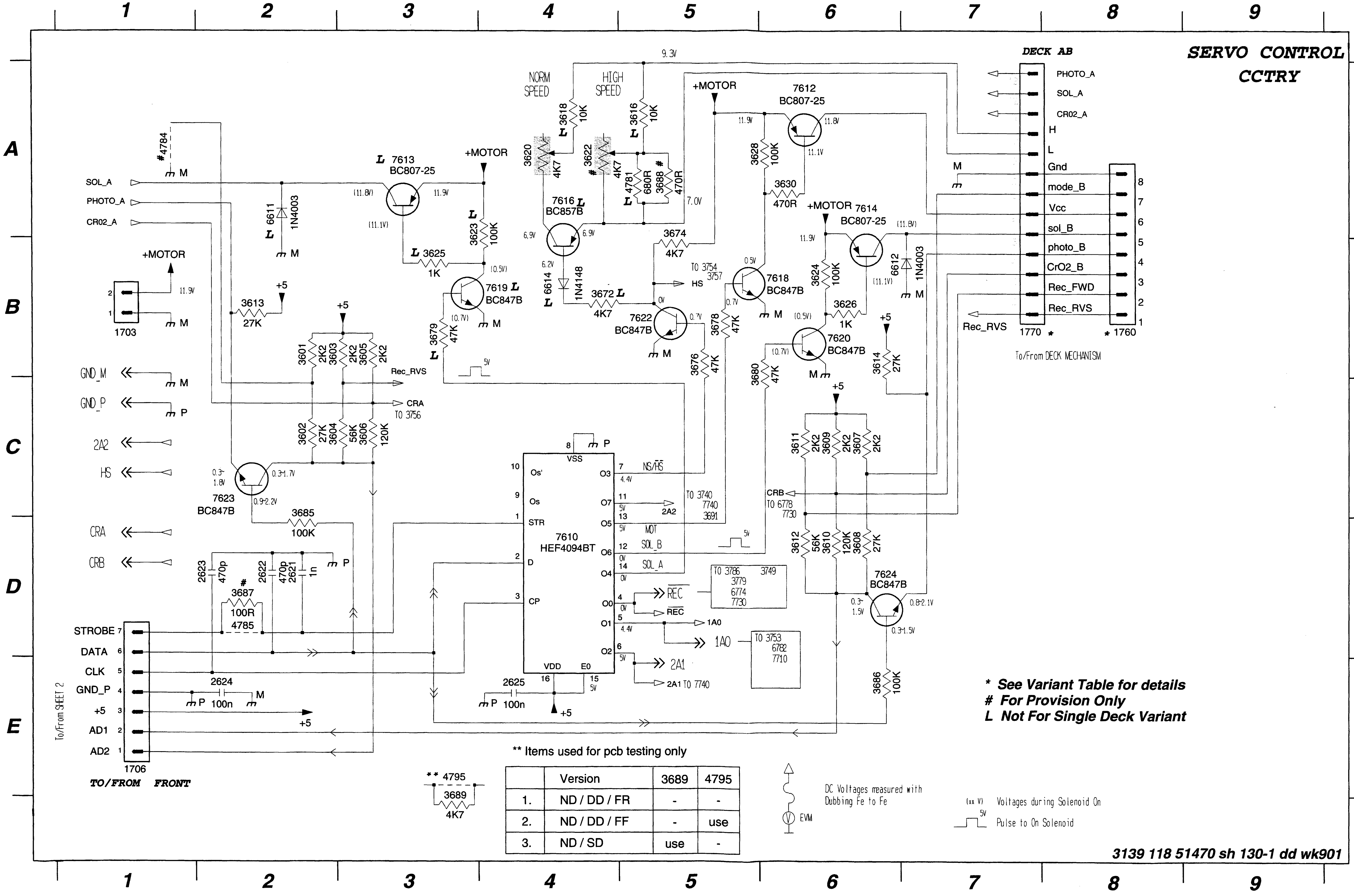
ANALOG CCTR

3139 118 51470 sh 130-2 dd wk901

1701	F9
1710	C1
1730	A1
2701	B2
2702	B2
2703	A2
2704	B2
2705	A2
2706	A2
2707	A4
2708	B4
2709	A5
2710	B5
2711	A6
2712	B6
2713	A6
2714	B6
2715	A4
2716	C4
2717	C6
2718	D6
2719	C5
2720	D5
2721	C5
2722	D5
2723	C5
2724	D5
2725	D4
2726	D4
2727	A3
2728	D5
2729	A8
2730	B8
2733	A5
2734	C4
2735	B3
2737	A6
2738	B6
2741	D6
2742	C3
2743	F1
2744	A3
2760	E3
2761	B5
2762	B6
2763	B6
2765	B4
2769	F7
2770	F7
2780	F3
2781	F2
2782	F2
2784	F1
2785	F1
2786	D1
2787	D3
3701	B1
3702	B2
3703	A2
3704	A1
3705	A4
3706	B4
3707	A5
3708	B4
3709	A4
3710	C4
3711	A5
3712	B4
3713	A7
3714	B7
3715	A6
3716	B6
3717	C6
3718	D6
3719	C6
3720	D6
3721	C6
3722	D6
3723	A3
3724	D5
3725	C5
3726	D5
3727	A7
3728	B7
3729	A7
3730	B7
3731	A7
3732	A7
3733	A2
3734	B2
3735	A2
3736	B1
3741	A6
3742	B7
3743	F8
3744	F8
3745	F8
3746	E8
3748	C8
3749	C7
3751	E5
3752	F5
3753	F5
3754	E8
3755	E7
3756	D8
3757	D8
3758	D8
3759	D7
3760	A7
3761	E3
3762	E2
3763	A5
3764	A5
3765	B6
3766	B7
3767	A7
3768	E8
3769	E4
3770	F2
3771	F2
3772	F3
3773	E3
3774	E3
3775	F2
3776	F2
3777	F2
3778	E1
3779	D3
3780	D2
3781	D2
3782	C2
3784	D1
3785	C2
3786	F4
3787	C3
3788	C3
3789	F3
4790	C2
4794	C6
5701	D2
5702	C2
5703	F1
6770	E2
6771	E2
6772	D1
6773	D1
6774	D3
6775	C3
6776	F3
6777	E2
6778	E4
6782	C7
6785	A7
6786	B7
7710	A3
7720	A5
7730	D6
7740	A8
7780	F4
7781	F3
7782	E1
7783	E2
7784	D2
7785	C3
7786	C2
7787	C8
7791	F5
7792	D8
9791	A8
9792	B8
9793	A6

SERVO CONTROL CIRCUIT

1703 B1
1706 E1
1760 B8
1770 B7
2621 D2
2622 D2
2623 D2
2624 E2
2625 E4
3601 B2
3602 C2
3603 B2
3604 C2
3605 B3
3606 C3
3607 C6
3608 D6
3609 C6
3610 D6
3611 C6
3612 D6
3613 B2
3614 B6
3616 A5
3618 A4
3620 A4
3622 A4
3623 A3
3624 B6
3625 B3
3626 B6
3628 A5
3630 A6
3672 B4
3674 A5
3676 B5
3678 B5
3679 B3
3680 B5
3685 C2
3686 E6
3687 D2
3688 A5
3689 E3
4781 A5
4784 A1
4785 D2
4795 E3
6611 A2
6612 B6
6614 B4
7610 D4
7612 A6
7613 A3
7614 A6
7616 A4
7618 B6
7619 B4
7620 B6
7622 B5
7623 C2
7624 D6



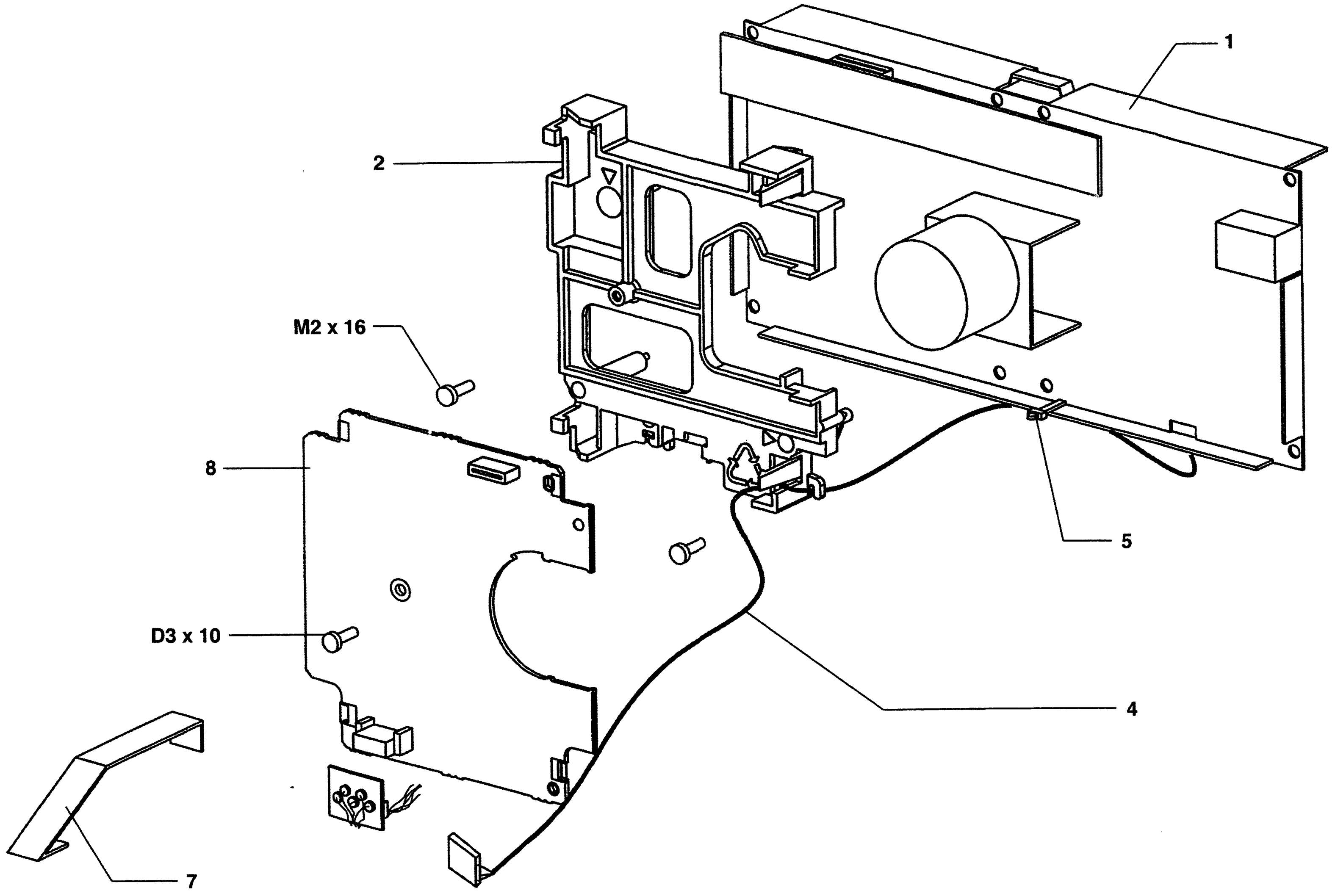
SERVO CONTROL CCTRY
DECK AB
9.3V
NORM SPEED
HIGH SPEED
+MOTOR
7612 BC807-25
7613 BC807-25
7614 BC807-25
7616 BC857B
7618 BC847B
7619 BC847B
7620 BC847B
7622 BC847B
7623 BC847B
7624 BC847B
7610 HEF4094BT
SOL_A
PHOTO_A
CR02_A
1703
1706
1770
1760
GND_M
GND_P
2A2
HS
CRA
CRB
Rec_RVS
Rec_FWD
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
TO/FROM FRONT
To/From SHEET 2
To/From DECK MECHANISM
H
L
Gnd
mode_B
Vcc
sol_B
photo_B
CrO2_B
Rec_RVS
NS/HS
MOT
SOL_B
SOL_A
REC
1A0
2A1
2A1 TO 7740
TO 3786 3749 3779 6774 7730
TO 3753 6782 7710
TO 3740 7740 3691
TO 3754 3757
CRB TO 6778 7730
CRA TO 3756
4795
3689 4K7
DC Voltages measured with Dubbing Fe to Fe
EVM
(xx V) Voltages during Solenoid On
Pulse to On Solenoid
1
2
3
4
5
6
7
8
9
A
B
C
D
E

** Items used for pcb testing only

	Version	3689	4795
1.	ND / DD / FR	-	-
2.	ND / DD / FF	-	use
3.	ND / SD	use	-

** See Variant Table for details*
# For Provision Only
L Not For Single Deck Variant

3139 118 51470 sh 130-1 dd wk901


1
2
M2 x 16
8
5
D3 x 10
4
7

ETF6 TAPE MODULE EXPLODED VIEW

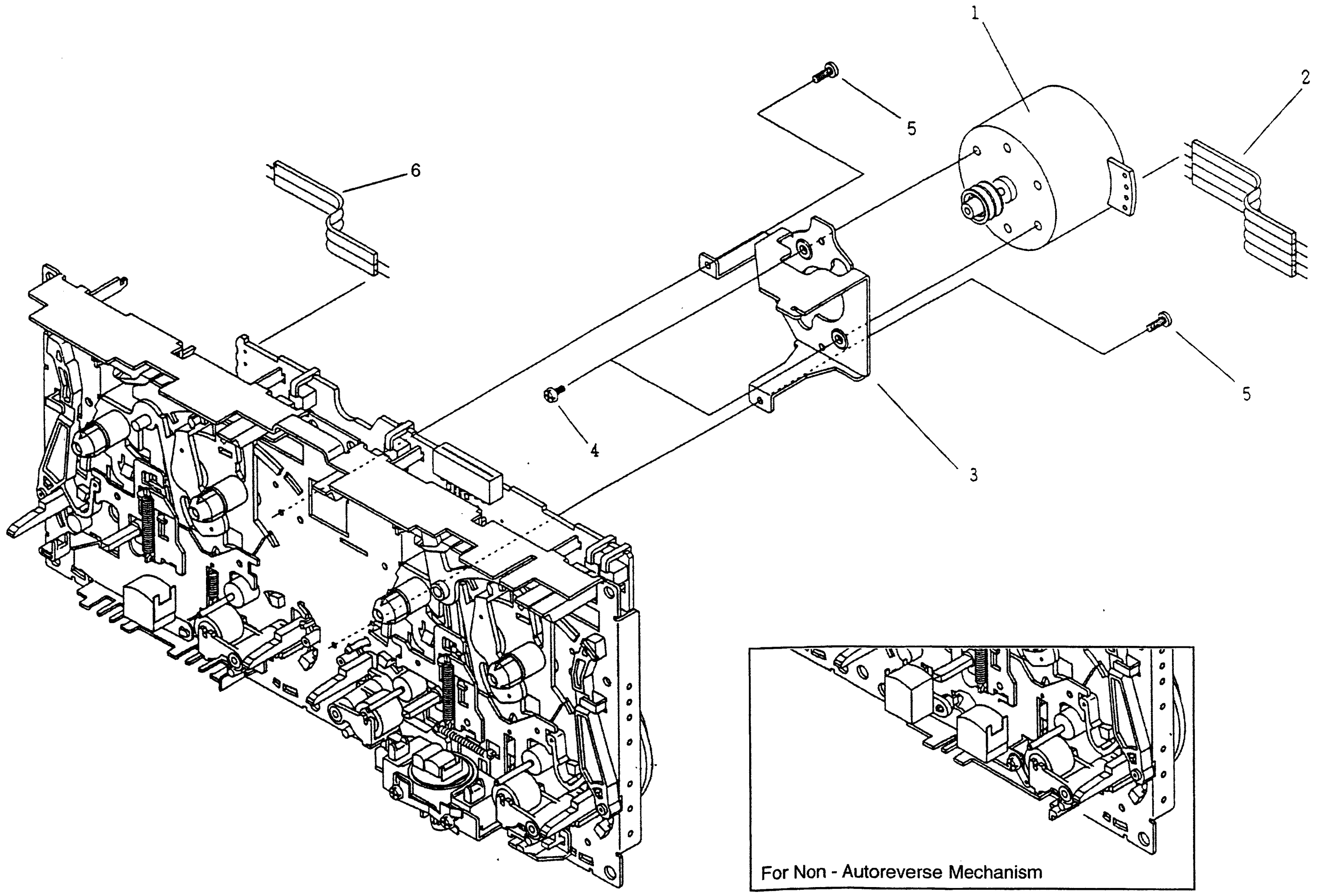
1	4822 691 10673	Autoreverse Mech. CWC44FR02
1	4822 691 10672	Non-Autoreverse Mech. CWC44FF01
7	4822 320 12245	Flex Cable 13 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.

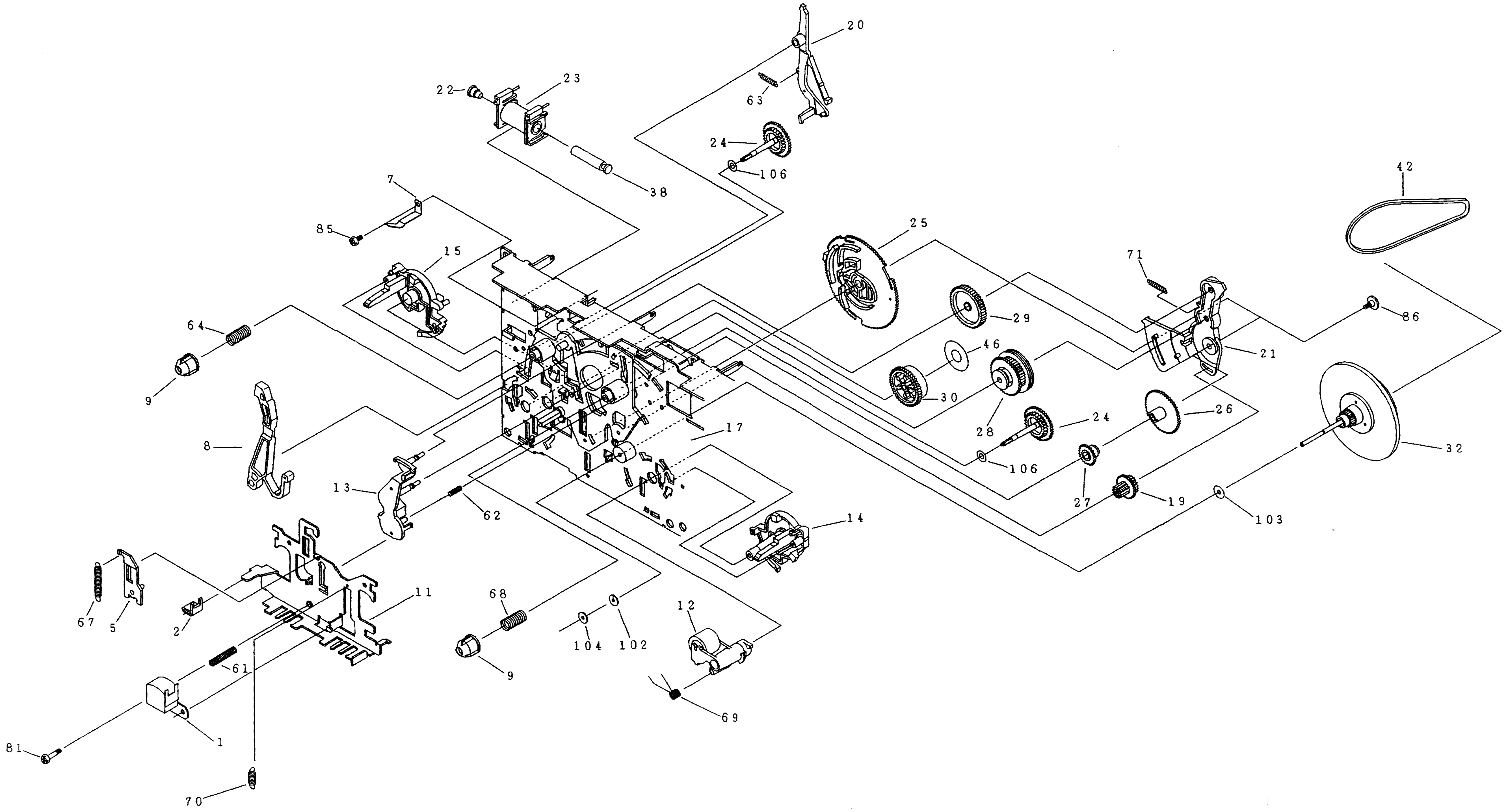
TAPE MECHANISM - MOTOR EXPLODED VIEW

1	4822 361 11055	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.


1
2
6
5
5
4
3
For Non - Autoreverse Mechanism

TAPE MECHANISM A - PLAY


20
23
22
63
24
106
38
7
85
15
42
25
71
64
29
86
46
21
9
30
26
28
24
17
8
32
13
106
27
19
103
62
14
11
68
12
67
5
2
104
102
61
9
69
1
81
70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
42	4822 358 10168	Belt AF
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in this list are normal service spare parts.

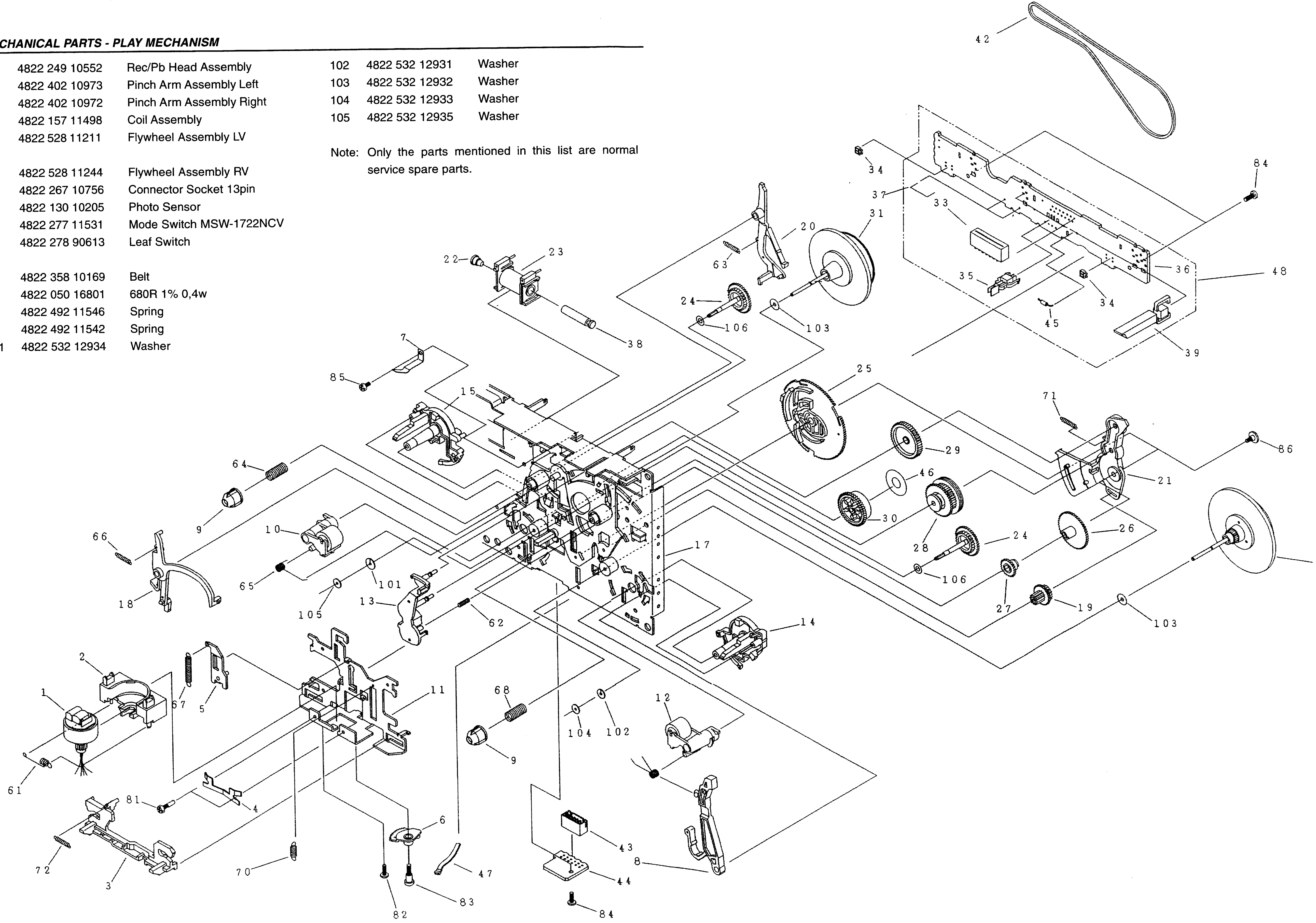
TAPE MECHANISM B - RECORD/PLAYBACK

(Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10552	Rec/Pb Head Assembly
10	4822 402 10973	Pinch Arm Assembly Left
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
31	4822 528 11211	Flywheel Assembly LV
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


42
84
34
37
33
31
20
63
36
48
35
34
45
39
22
23
24
106
103
38
7
85
15
25
71
86
29
46
21
30
28
24
26
32
64
9
10
66
17
106
27
19
103
18
65
101
105
13
62
14
2
1
67
5
11
68
12
104
102
9
61
81
4
6
43
8
72
3
70
47
44
82
83
84

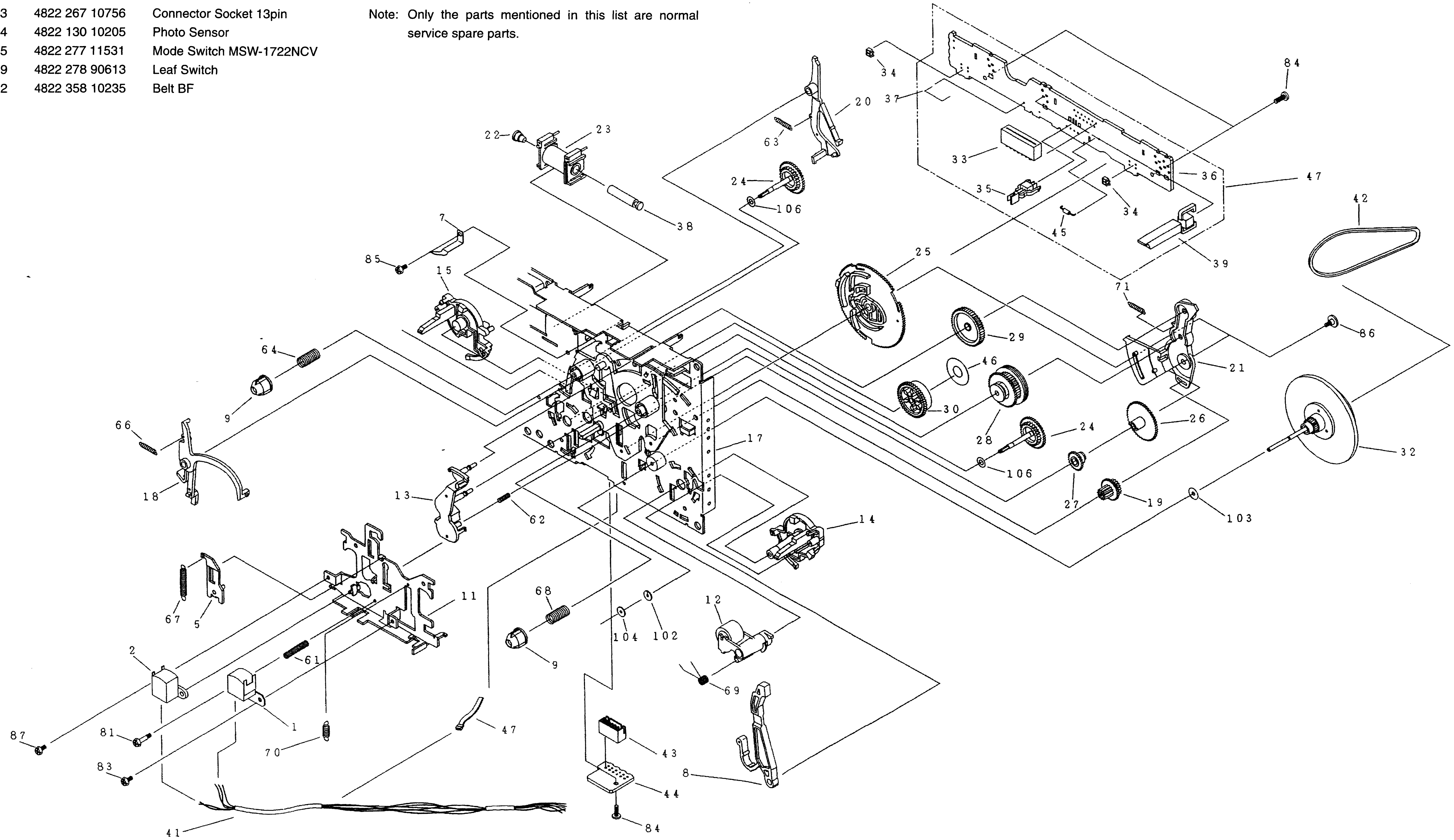
TAPE MECHANISM B - RECORD/PLAYBACK

(Non-Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	Rec/Pb Head Assembly
2	4822 249 40303	Erase Head
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10235	Belt BF
45	4822 050 16801	680R 1% 0,4w
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


34
84
20
37
23
22
63
33
36
47
24
106
35
34
42
38
45
39
7
25
85
15
71
29
64
46
86
21
9
30
66
28
24
26
17
106
32
18
13
27
19
62
103
14
11
68
12
67
5
104
102
2
61
9
69
47
87
81
1
70
43
83
8
44
41
84

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7P Vert.
1706	4822 267 10953	Flex Socket 7P Vert.
1770	4822 267 10738	Flex Socket 13P Vert.

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	5322 122 34099	470pF 10% 63V
2624	4822 126 13196	100nF 10% 25V
2625	4822 126 13196	100nF 10% 25V
2701	5322 122 33538	150pF 2% 63V
2702	5322 122 33538	150pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	4822 122 33575	220pF 5% 50V
2706	4822 122 33575	220pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 40196	220µF 20% 16V
2716	4822 124 40196	220µF 20% 16V
2717	4822 122 33177	10nF 20% 50V
2718	4822 122 33177	10nF 20% 50V
2719	4822 126 12105	33nF 5% 63V
2720	4822 126 12105	33nF 5% 63V
2721	5322 122 31866	6,8nF 10% 63V
2722	5322 122 31866	6,8nF 10% 63V
2723	4822 126 13188	15nF 5% 63V
2724	4822 126 13188	15nF 5% 63V
2725	5322 126 10223	4,7nF 10% 63V
2726	5322 126 10223	4,7nF 10% 63V
2727	5322 122 34123	1nF 10% 50V
2728	5322 122 34123	1nF 10% 50V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13196	100nF 10% 25V
2737	4822 126 13196	100nF 10% 25V
2738	4822 126 13196	100nF 10% 25V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	5322 122 32654	22nF 10% 63V
2744	4822 126 13196	100nF 10% 25V
2760	4822 126 13196	100nF 10% 25V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40246	4,7µF 20% 63V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 63V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 117 11148	56k 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 117 11148	56k 1% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3616	4822 117 10833	10k 1% 0,1W
3618	4822 117 10833	10k 1% 0,1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3701	4822 117 11503	220R 1% 0,1W
3702	4822 117 11503	220R 1% 0,1W
3703	4822 117 11503	220R 1% 0,1W
3704	4822 117 11503	220R 1% 0,1W
3705	4822 117 11503	220R 1% 0,1W
3706	4822 117 11503	220R 1% 0,1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

3709	4822 051 20688	6R8 5% 0,1W
3710	4822 051 20688	6R8 5% 0,1W
3711	4822 051 20154	150k 5% 0,1W
3712	4822 051 20154	150k 5% 0,1W
3713	4822 051 20109	10R 5% 0,1W
3714	4822 051 20109	10R 5% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 117 11449	2k2 1% 0,1W
3718	4822 117 11449	2k2 1% 0,1W
3719	4822 051 20472	4k7 5% 0,1W
3720	4822 051 20472	4k7 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W *Autoreverse*
3723	4822 051 20153	15k 5% 0,1W *Non-Autoreverse*
3724	4822 117 11383	12k 1% 0,1W *Autoreverse*
3724	4822 051 20153	15k 5% 0,1W *Non-Autoreverse*
3725	4822 051 20109	10R 5% 0,1W
3726	4822 051 20109	10R 5% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 117 11507	6k8 1% 0,1W
3732	4822 117 11507	6k8 1% 0,1W
3733	4822 051 10102	1k 2% 0,25W
3734	4822 051 10102	1k 2% 0,25W
3735	4822 051 20223	22k 5% 0,1W
3736	4822 051 20223	22k 5% 0,1W
3741	4822 117 11449	2k2 1% 0,1W
3742	4822 117 11449	2k2 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3743	4822 051 10102	1k 2% 0,25W *Non-Autoreverse*
3744	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3744	4822 051 10102	1k 2% 0,25W *Non-Autoreverse*
3745	4822 051 20332	3k3 5% 0,1W
3746	4822 051 20332	3k3 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20105	1M 5% 0,1W
3755	4822 051 20105	1M 5% 0,1W
3756	4822 117 13579	220k 1% 0,1W
3757	4822 117 13579	220k 1% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 11383	12k 1% 0,1W *Autoreverse*
3769	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20472	4k7 5% 0,1W *Autoreverse*
3772	4822 051 20562	5k6 5% 0,1W *Non-Autoreverse*
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 117 10833	10k 1% 0,1W *Autoreverse*
3774	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688 ⚠	6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3784	4822 051 10102	1k 2% 0,25W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

RESISTORS

4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4781	4822 051 20681	680R 5% 0,1W
4785	4822 051 20008	0R Jumper 0805
4790	4822 051 20008	0R Jumper 0805
4794	4822 051 20008	0R Jumper 0805
4795	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5701	4822 157 11477	Coil 2,2µH 5%
5703	4822 156 20946	Oscillator Coil 100kHz

DIODES

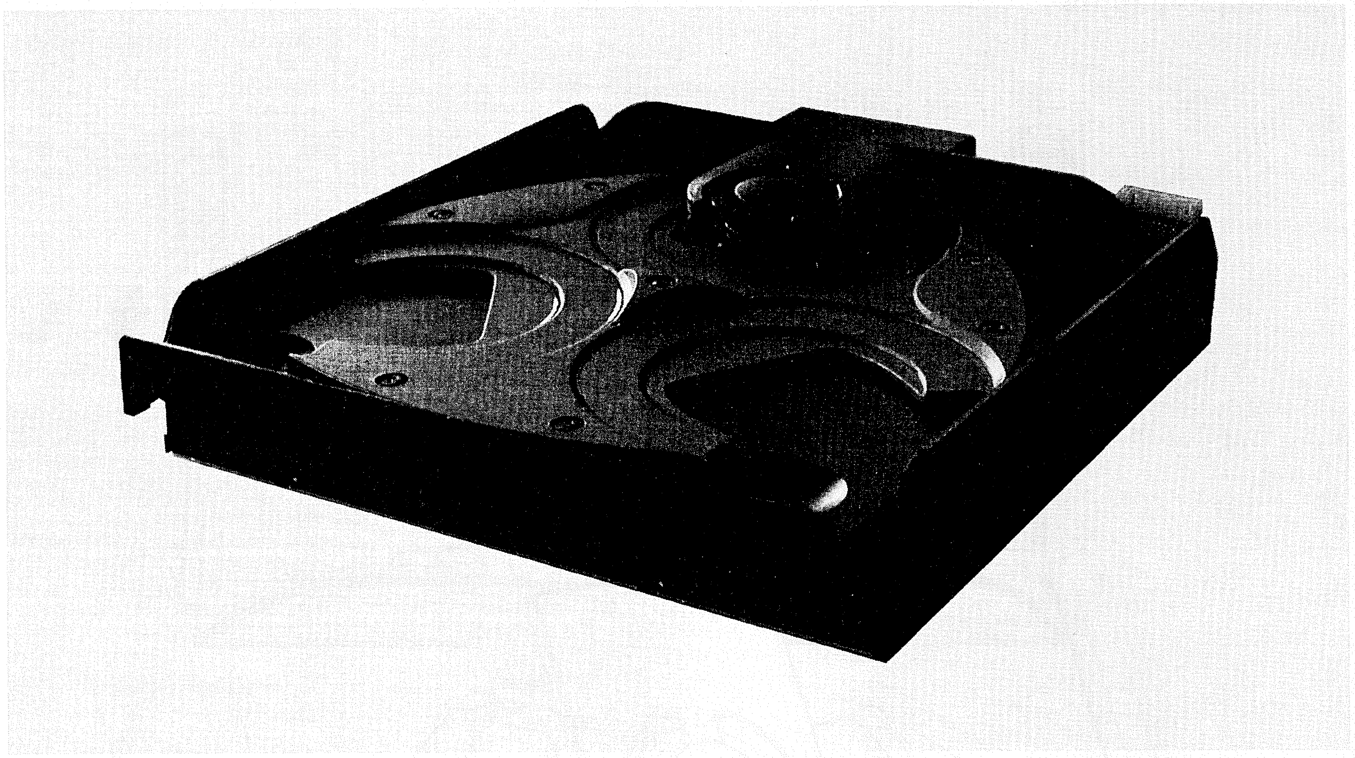
6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 42804	BC817-25
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.

PCS 101 041



3CDC 99 Module

(3 Disc Carrousel Changer)

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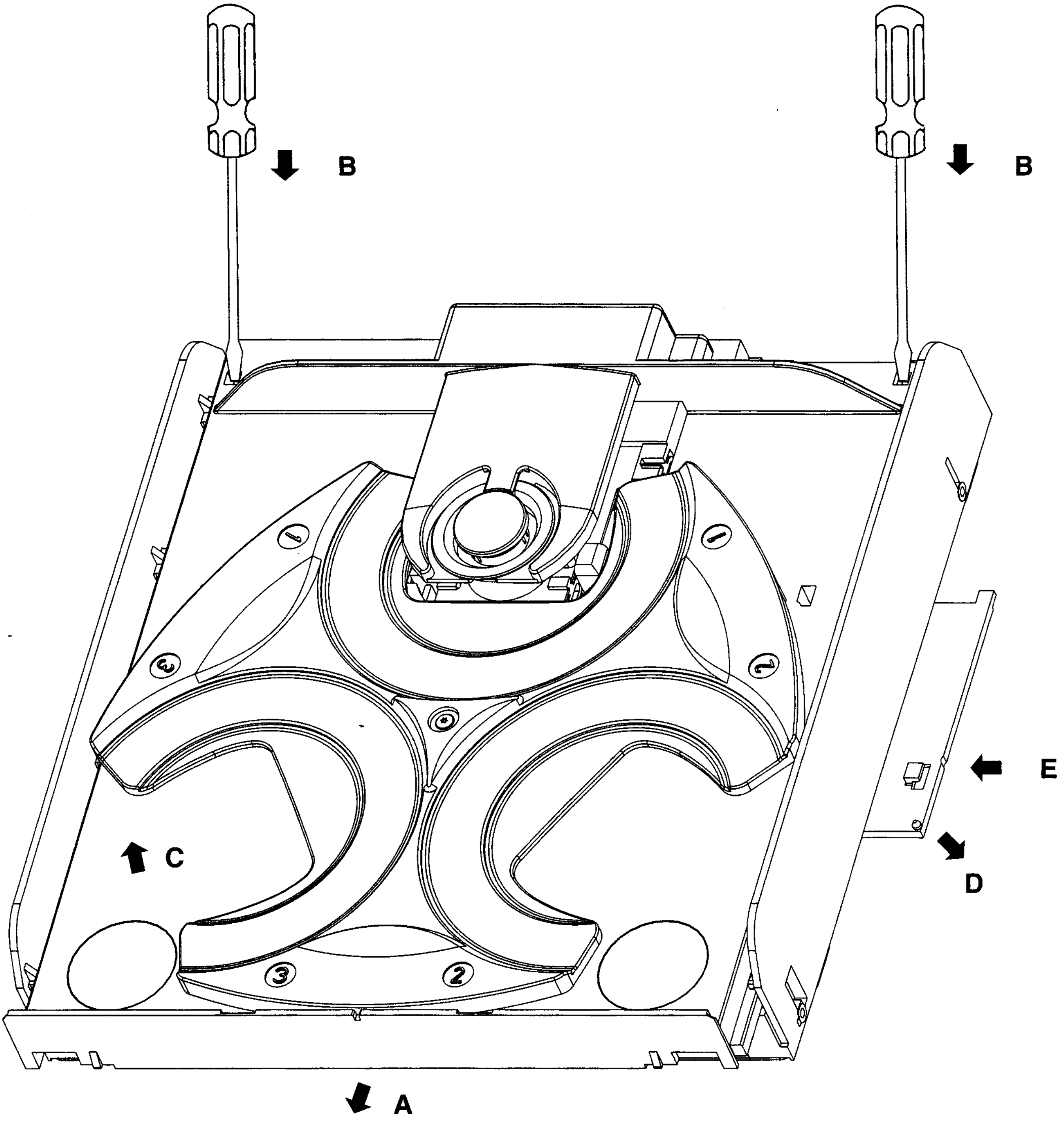
Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

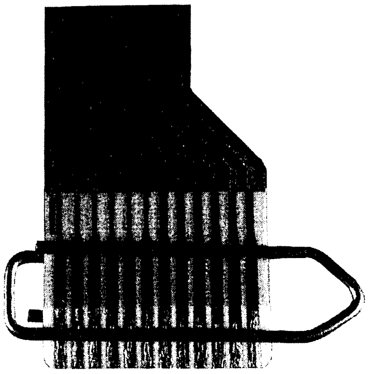
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

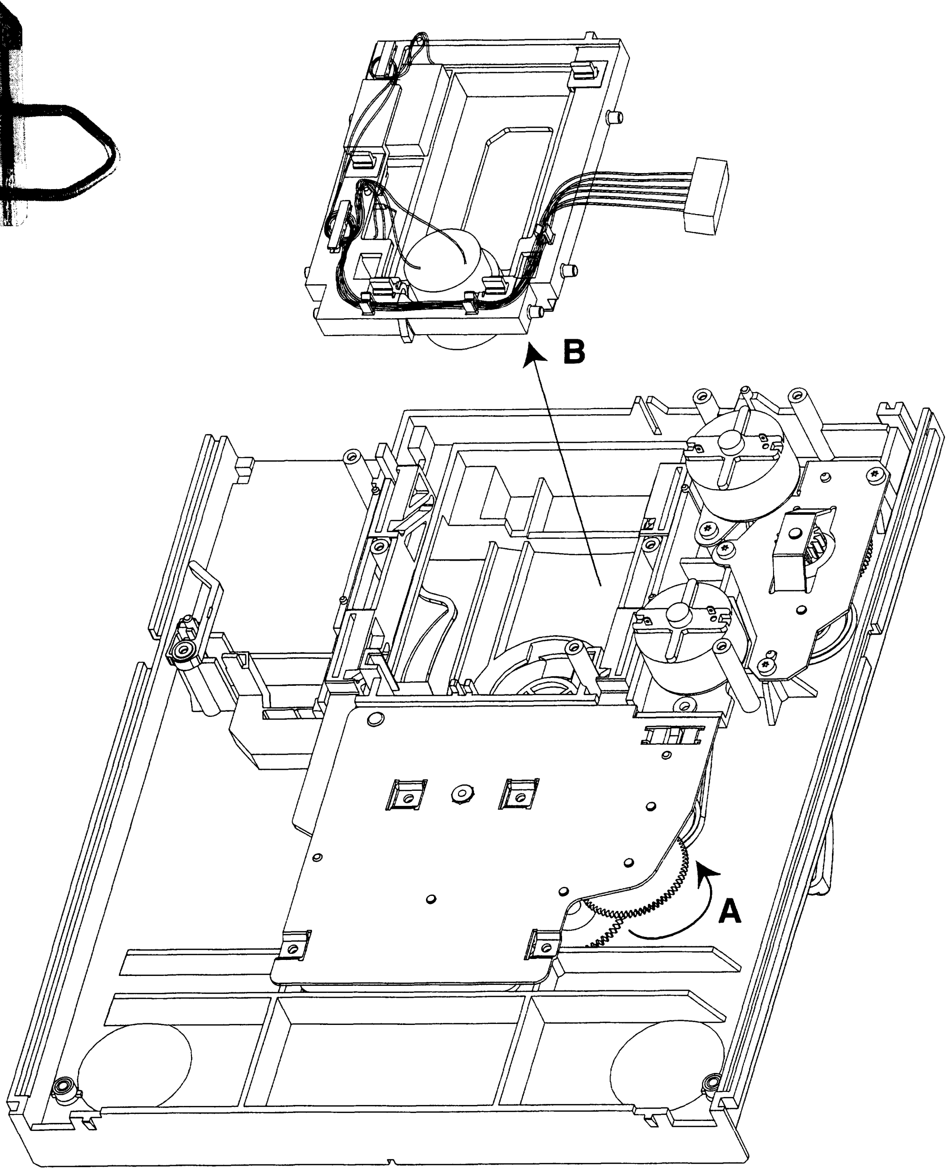
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount printed circuit board: remove 5 screws.
2. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
3. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
4. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
5. Demount CD drive support (pos 95) Ⓑ.
6. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

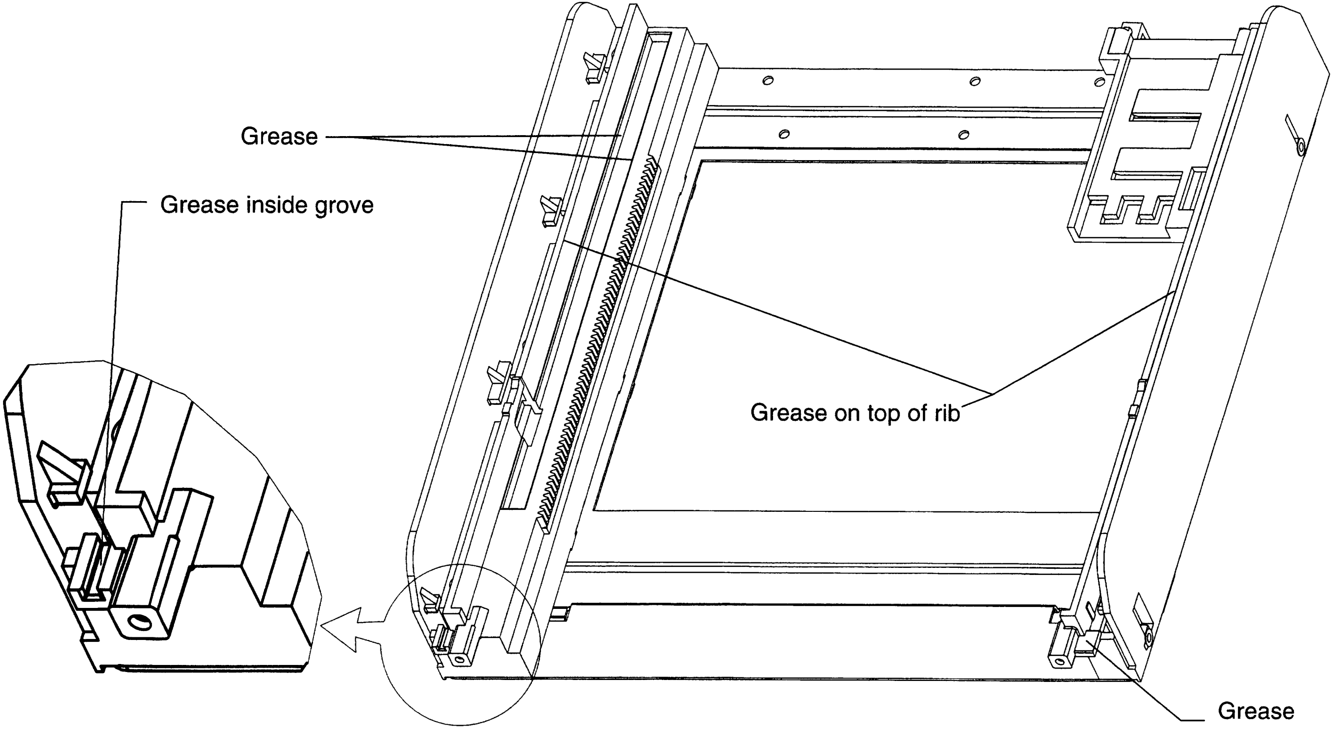


Mounting of Carrousel

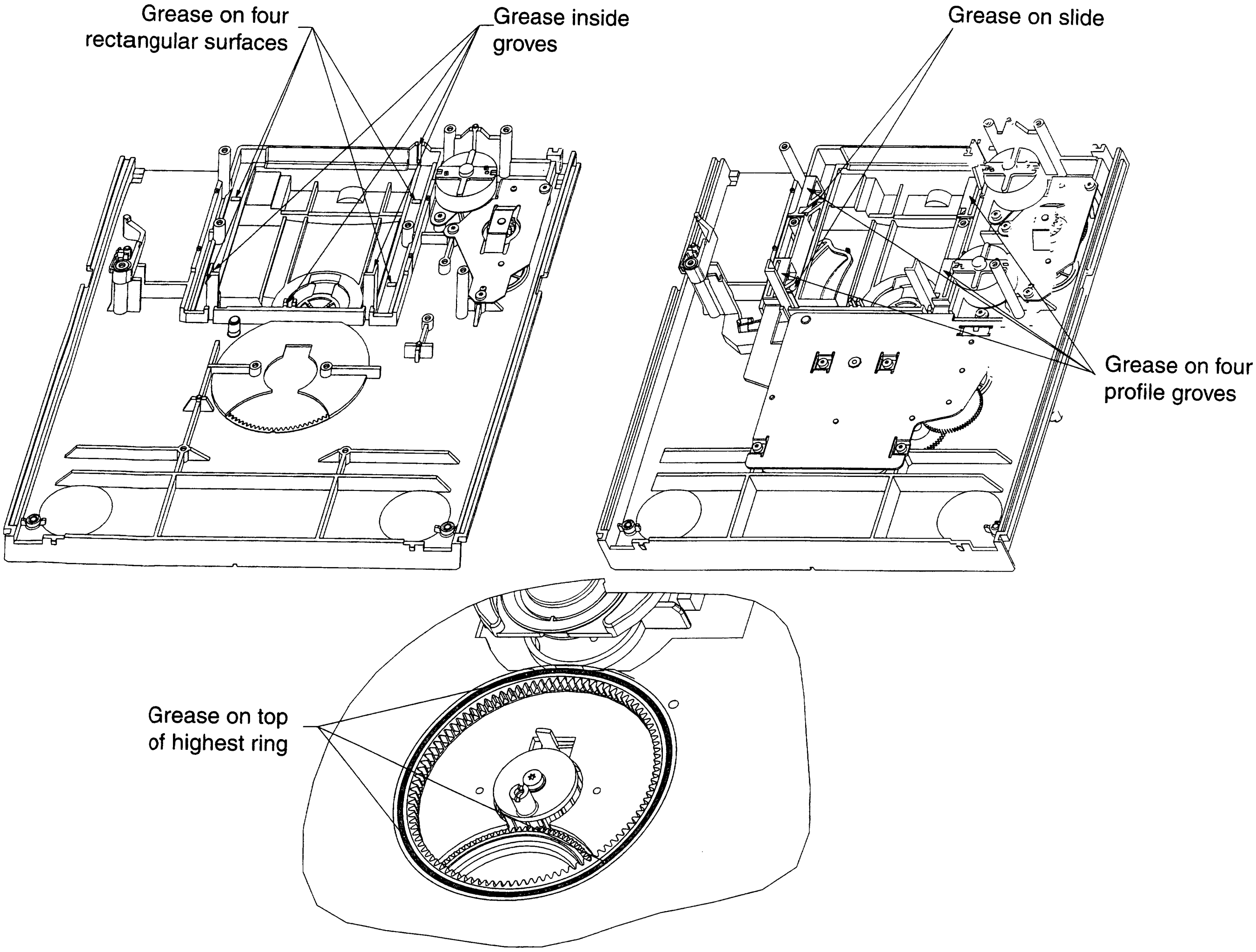
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

Lubrication Instructions

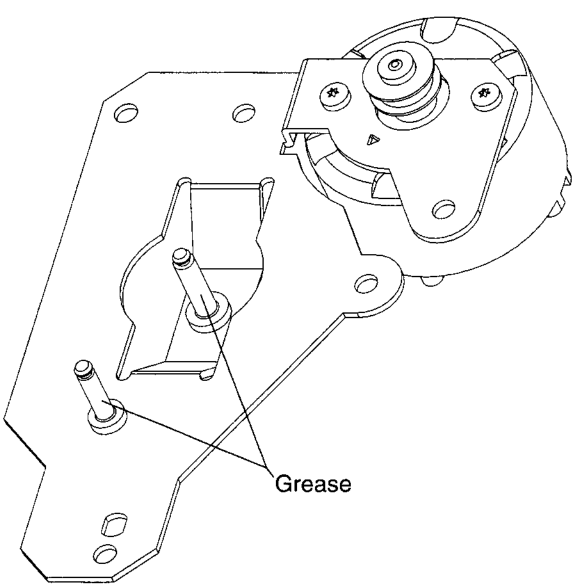
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

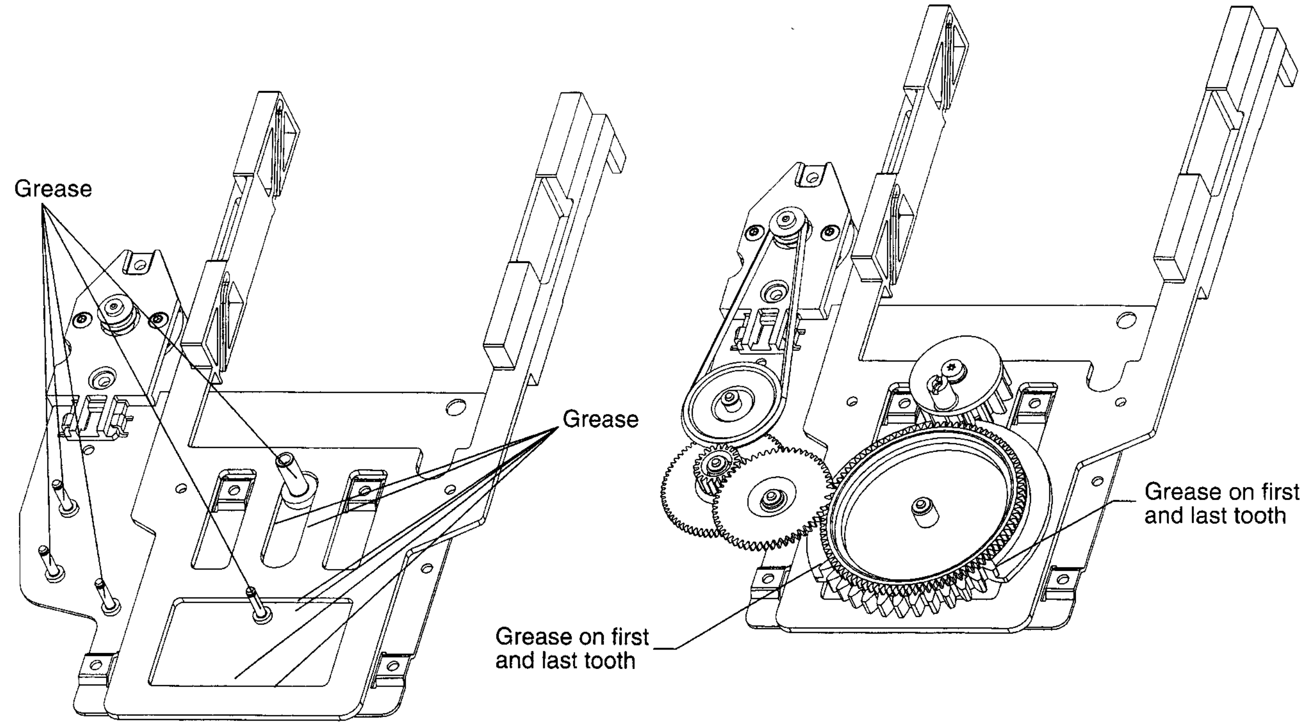
DRAWER


Grease on four rectangular surfaces
Grease inside groves
Grease on slide
Grease on four profile groves
Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

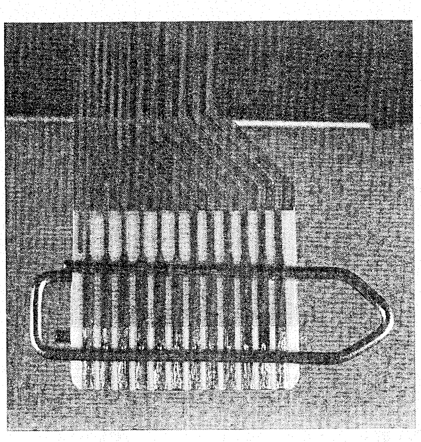


fig.1

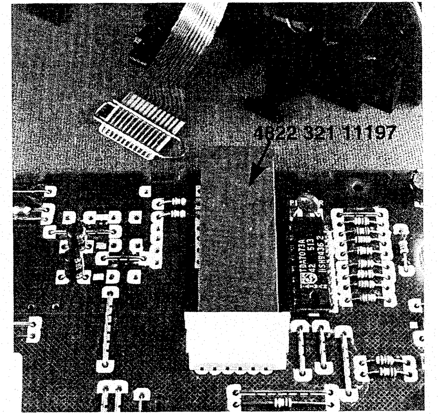


fig.2

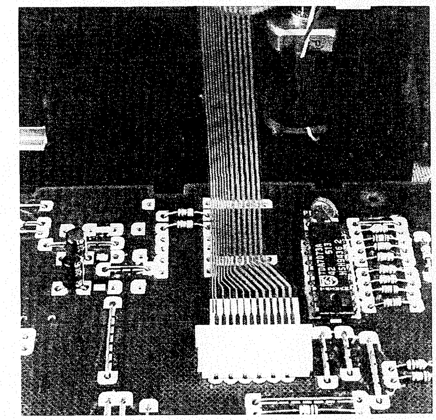
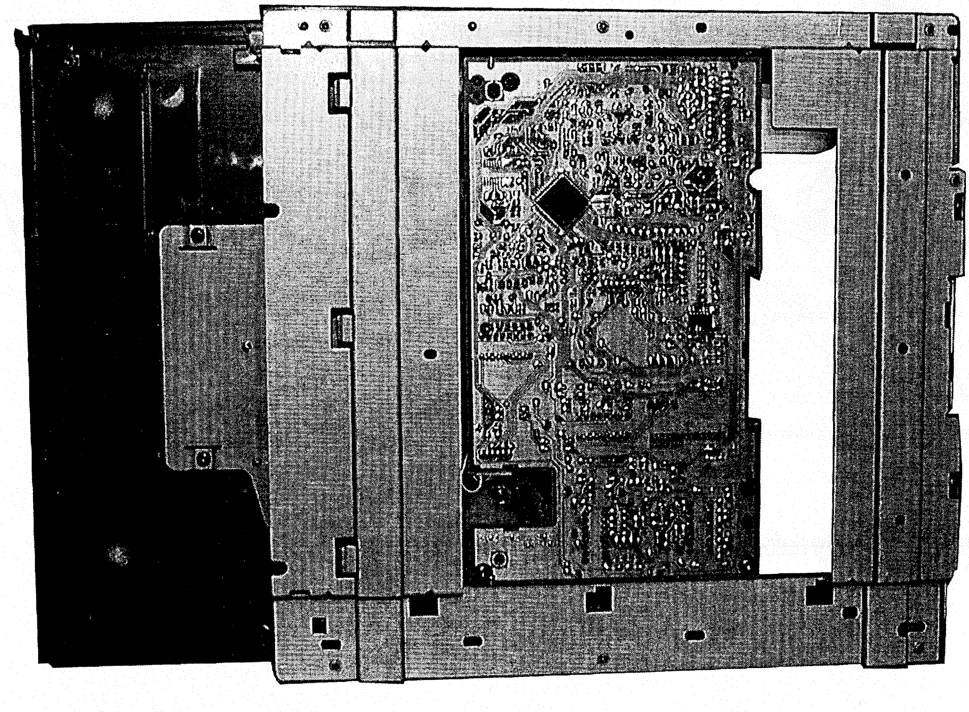
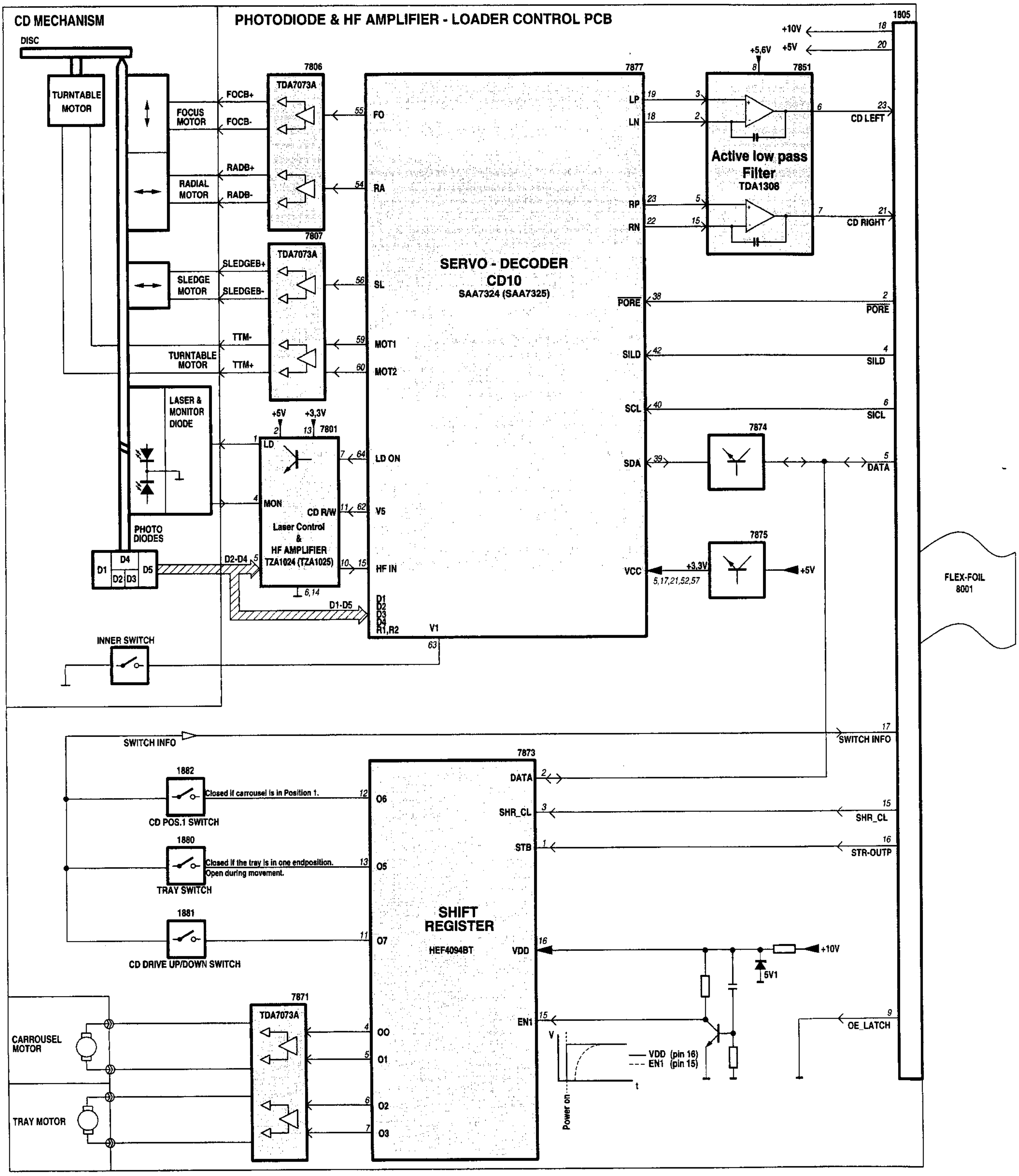


fig.3

Service Position

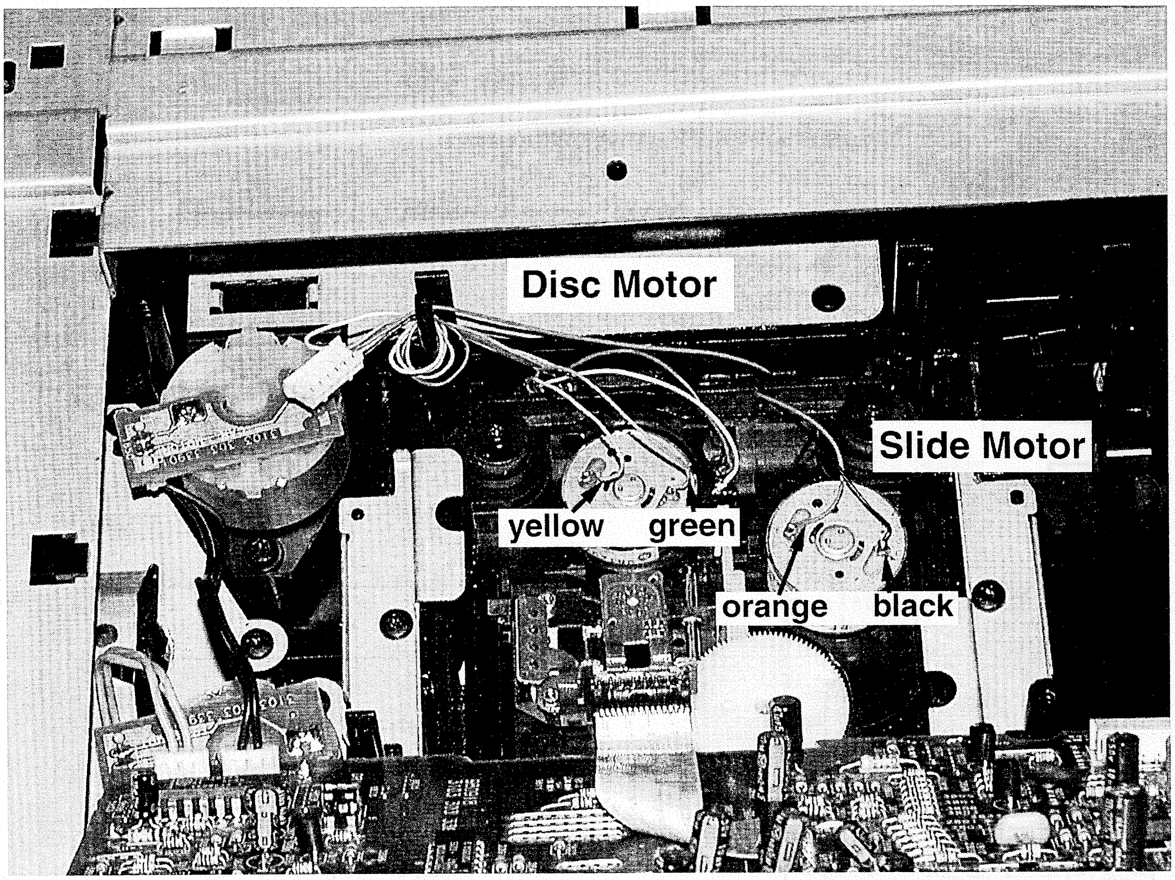


Blockdiagram

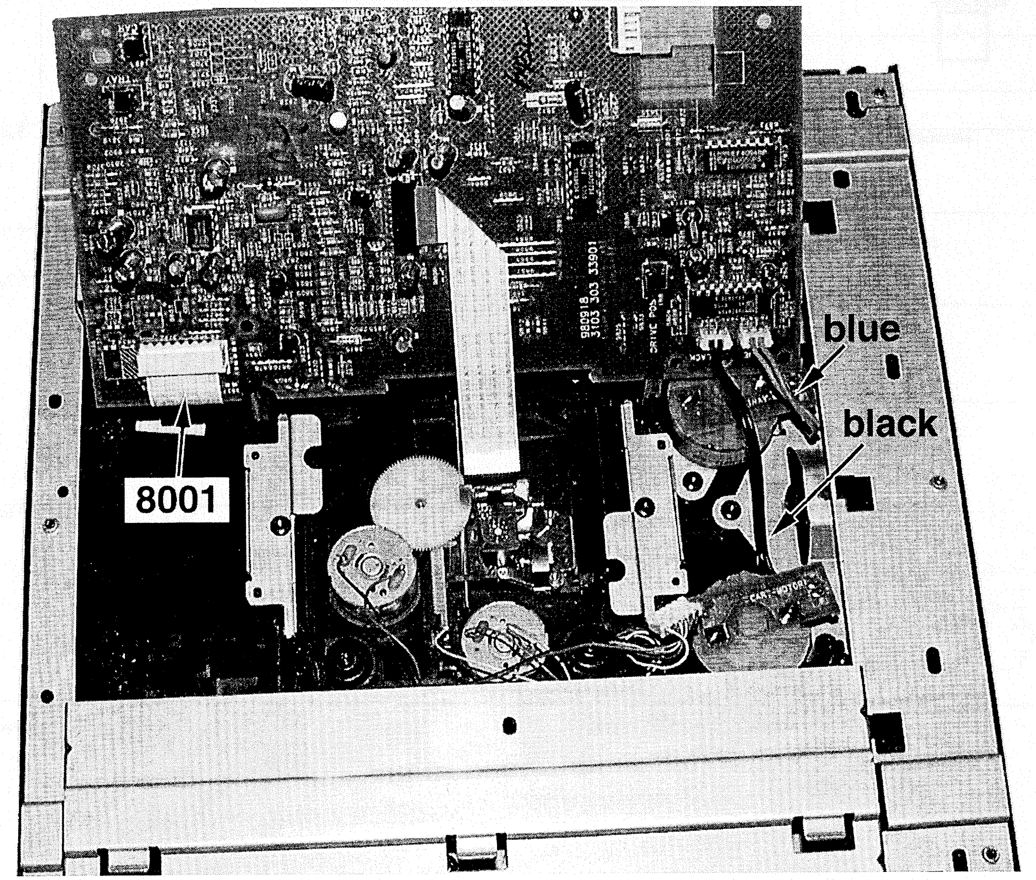

CD MECHANISM
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER & MONITOR DIODE
PHOTO DIODES
D1
D4
D2
D3
D5
INNER SWITCH
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
FOCB+
FOCB-
RADB+
RADB-
SLEDGEB+
SLEDGEB-
TTM-
TTM+
7806
TDA7073A
7807
TDA7073A
+5V
+3,3V
7801
LD
MON
CD R/W
Laser Control & HF AMPLIFIER TZA1024 (TZA1025)
D2-D4
6,14
D1-D5
7877
FO
RA
SL
MOT1
MOT2
LD ON
V5
HF IN
D1 D2 D3 D4 R1,R2
V1
63
SERVO - DECODER CD10
SAA7324 (SAA7325)
LP
LN
RP
RN
PORE
SILD
SCL
SDA
VCC
5,17,21,52,57
+3,3V
7851
+5,6V
+10V
+5V
Active low pass Filter
TDA1308
CD LEFT
CD RIGHT
PORE
SILD
SICL
DATA
7874
7875
+5V
1805
FLEX-FOIL 8001
SWITCH INFO
SWITCH INFO
1882
Closed if carrousel is in Position 1.
CD POS.1 SWITCH
1880
Closed if the tray is in one endposition. Open during movement.
TRAY SWITCH
1881
CD DRIVE UP/DOWN SWITCH
7873
DATA
SHR_CL
STB
O6
O5
O7
SHIFT REGISTER
HEF4094BT
VDD
EN1
O0
O1
O2
O3
SHR_CL
STR-OUTP
+10V
5V1
OE_LATCH
V
t
Power on
VDD (pin 16)
EN1 (pin 15)
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR

Blockdiagram 3CDC99 19981202

Wiring of CD Drive

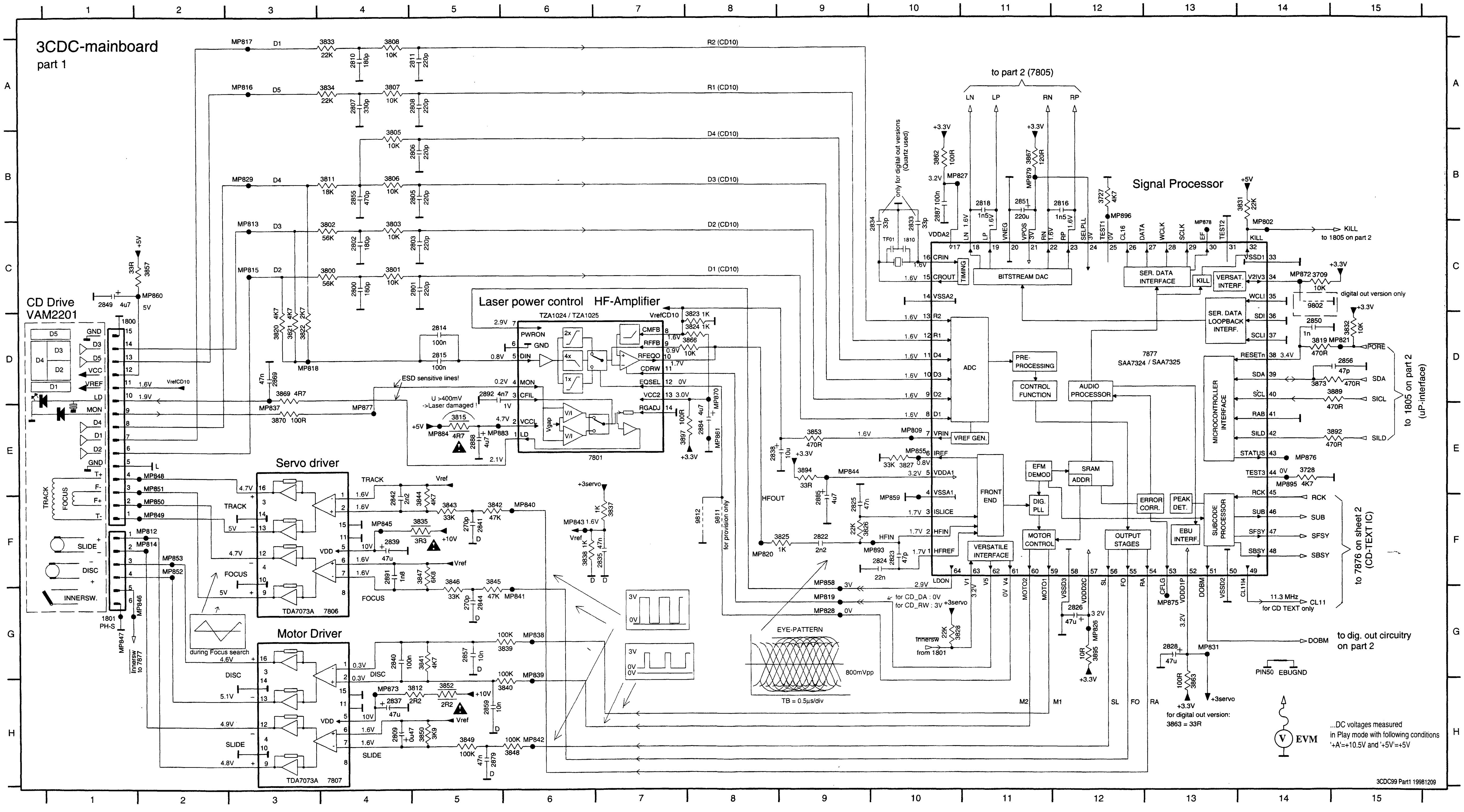

Disc Motor
Slide Motor
yellow
green
orange
black

Pict. 1

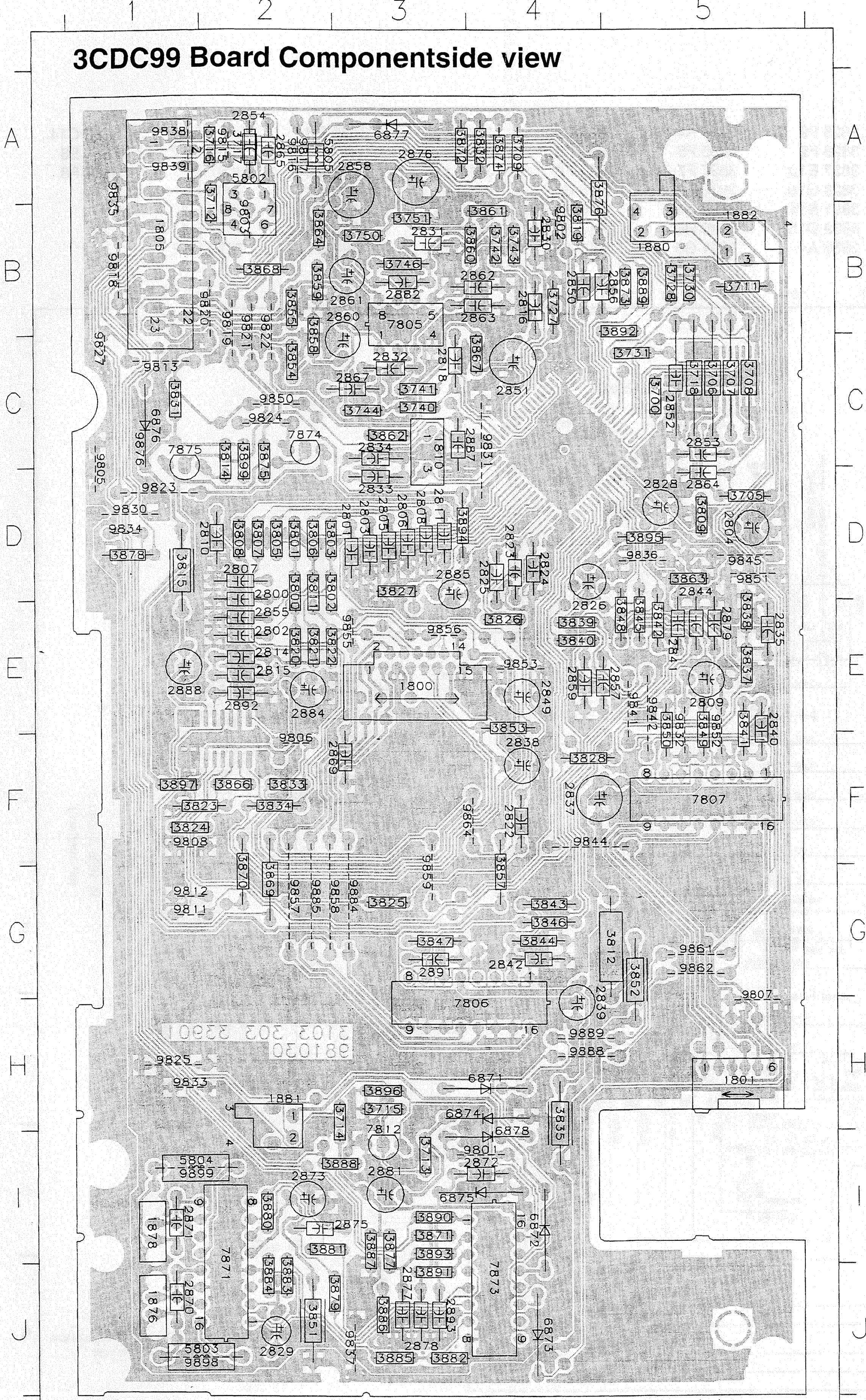

blue
black
8001

Pict. 2

1800 D2
1801 G1
1810 C10
2800 C4
2801 C5
2802 C4
2803 C5
2805 B5
2806 B5
2807 A4
2808 A5
2809 H4
2810 A4
2811 A5
2814 D5
2815 D5
2816 B12
2818 B11
2822 F9
2823 F10
2824 F10
2825 F9
2826 G12
2828 G13
2833 C10
2834 C10
2835 F7
2837 H4
2838 E8
2839 F4
2840 G4
2841 F5
2842 F4
2844 G5
2849 C1
2850 D14
2851 B11
2855 B4
2856 D15
2857 G5
2859 H5
2869 D3
2879 H5
2880 D8
2884 E8
2885 F9
2887 B10
2888 E5
2891 F4
2892 D5
3709 C14
3727 B12
3728 E14
3800 C4
3801 C4
3802 C4
3803 C4
3805 B4
3806 B4
3807 A4
3808 A4
3811 B4
3812 H5
3815 E5
3819 D14
3820 D3
3821 D3
3822 D3
3823 D8
3824 D8
3825 F9
3826 F9
3827 E10
3828 G10
3831 B14
3832 D15
3833 A4
3834 A4
3835 F5
3837 F7
3838 F6
3839 G6
3840 H6
3841 G5
3842 F5
3843 F5
3844 F5
3845 F5
3846 F5
3847 F5
3848 H6
3849 H5
3850 H5
3852 H5
3853 E9
3857 C2
3862 B10
3863 H13
3866 D8
3867 B11
3869 D3
3870 E3
3873 D14
3889 D15
3892 E15
3894 E9
3895 G12
3897 E7
7801 E7
7806 G4
7807 H4
7877 D12
9802 C14
9811 F8
9812 F8

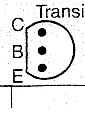

3CDC-mainboard
part 1
CD Drive
VAM2201
Laser power control HF-Amplifier
TZA1024 / TZA1025
7801
Servo driver
TDA7073A 7806
Motor Driver
TDA7073A 7807
Signal Processor
7877
SAA7324 / SAA7325
to part 2 (7805)
LN LP RN RP
R2 (CD10)
R1 (CD10)
D4 (CD10)
D3 (CD10)
D2 (CD10)
D1 (CD10)
BITSTREAM DAC
SER. DATA INTERFACE
KILL
VERSAT. INTERF.
SER. DATA LOOPBACK INTERF.
ADC
PRE-PROCESSING
CONTROL FUNCTION
AUDIO PROCESSOR
MICROCONTROLLER INTERFACE
VREF GEN.
FRONT END
EFM DEMOD
SRAM
ADDR
DIG. PLL
ERROR CORR.
PEAK DET.
SUBCODE PROCESSOR
EBU INTERF.
MOTOR CONTROL
OUTPUT STAGES
VERSATILE INTERFACE
TIMING
KILL
to 1805 on part 2
digital out version only
to 1805 on part 2 (uP-interface)
SDA SICL SILD
RCK SUB SFSY SBSY
to 7876 on sheet 2 (CD-TEXT IC)
11.3 MHz for CD TEXT only
CL11
DOBM
to dig. out circuitry on part 2
only for digital out versions (Quartz used)
ESD sensitive lines!
U >400mV ->Laser damaged !
HFOUT
for provision only
during Focus search
TRACK
FOCUS
DISC
SLIDE
INNERSW.
Innersw to 7877
Innersw from 1801
for CD_DA : 0V
for CD_RW : 3V
EYE-PATTERN
800mVpp
TB = 0.5µs/div
for digital out version: 3863 = 33R
PIN50 EBUGND
EVM
...DC voltages measured in Play mode with following conditions '+A'=+10.5V and '+5V'=+5V
3CDC99 Part1 19981209

3CDC99 Board Componentside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

Transistor pinning

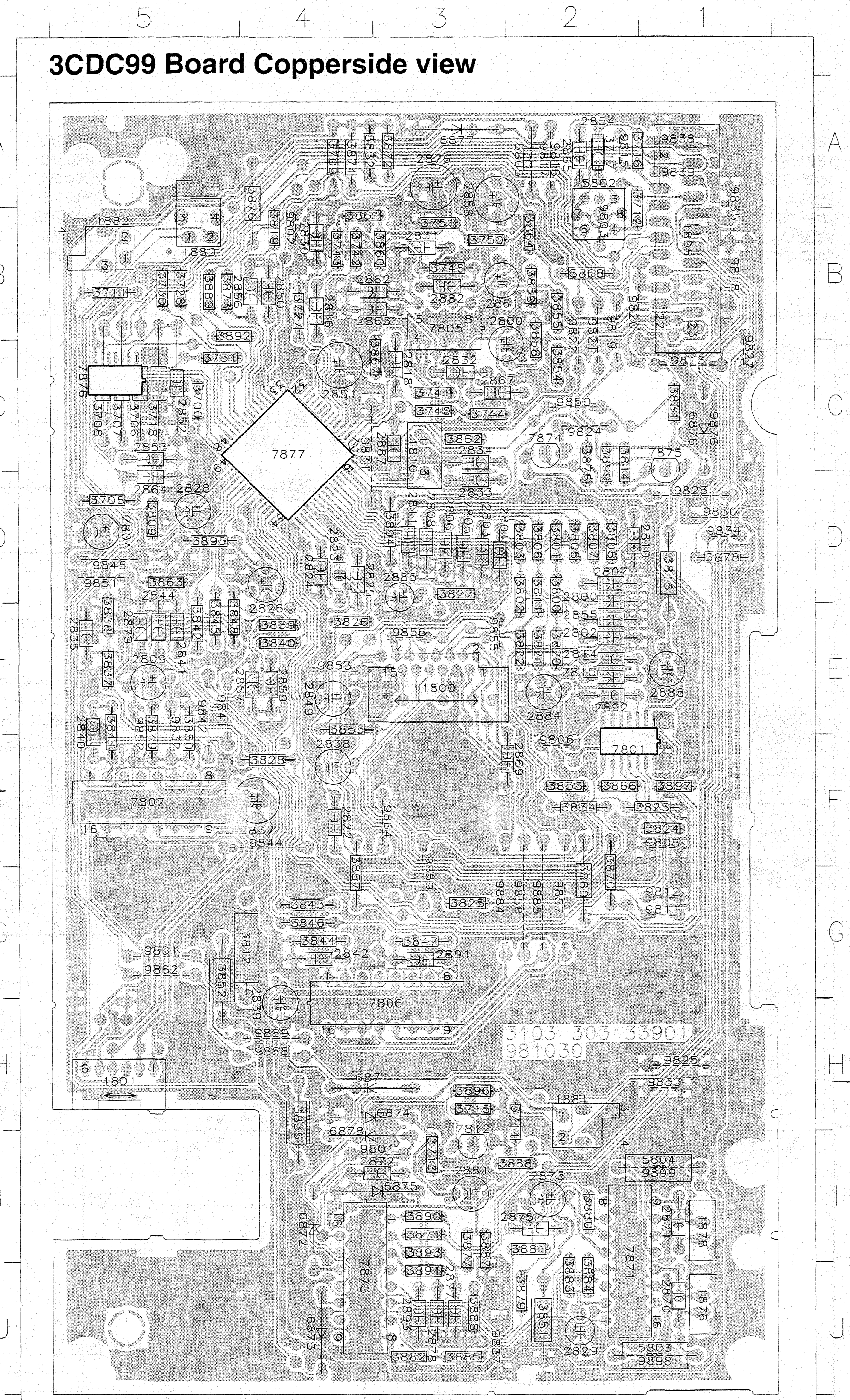


3CDC99 Layout stage 1 981205

Mapping

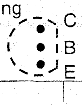
1800	E3
1801	H5
1805	B1
1810	C3
1876	J1
1878	I1
1880	B5
1881	H2
1882	B5
2800	D2
2801	D3
2802	E2
2803	D3
2804	D5
2805	D3
2806	D3
2807	D2
2808	D3
2809	E5
2810	D2
2811	D3
2814	E2
2815	E2
2816	B4
2818	C3
2822	F4
2823	D4
2824	D4
2825	D4
2826	E4
2828	D5
2829	J2
2830	B4
2831	B3
2832	C3
2833	D3
2834	C3
2835	E5
2837	F4
2838	F4
2839	H4
2840	E5
2841	E5
2842	G4
2844	D5
2849	E4
2850	B4
2851	C4
2852	C5
2853	C5
2854	A2
2855	E2
2856	B5
2857	E5
2858	A3
2859	E4
2860	B3
2861	B3
2862	B4
2863	B4
2864	D5
2865	A2
2867	C3
2869	F2
2870	J1
2871	I1
2872	I4
2873	I2
2875	I3
2876	A3
2877	J3
2878	J3
2879	E5
2881	I3
2882	B3
2884	E2
2885	D3
2887	C4
2888	E1
2891	G3
2892	E2
2893	J3
3700	C5
3705	D5
3706	C5
3707	C5
3708	C5
3709	A4
3711	B5
3712	B2
3713	I3
3714	H3
3715	H3
3716	A2
3717	A2
3718	C5
3727	B4
3728	B5
3730	B5
3731	C5
3740	C3
3741	C3
3742	B4
3743	B4
3744	C3
3746	B3
3750	B3
3751	B3
3800	D2
3801	D2
3802	D2
3803	D2
3805	D2
3806	D2
3807	D2
3808	D2
3809	D5
3811	D2
3812	G5
3814	C2
3815	D1
3819	B4
3820	E2
3821	E2
3822	E2
3823	F1
3824	F1
3825	G3
3826	E4
3827	D3
3828	F4
3831	C1
3832	A4
3833	F2
3834	F2
3835	H4
3837	E5
3838	E5
3839	E4
3840	E4
3841	E5
3842	E5
3843	G4
3844	G4
3845	E5
3846	G4
3847	G3
3848	E5
3849	E5
3850	E5
3851	J2
3852	G5
3853	E4
3854	C2
3855	B2
3857	G4
3858	C2
3859	B2
3860	B4
3861	B4
3862	C3
3863	D5
3864	B2
3866	F2
3867	C4
3868	B2
3869	G2
3870	G2
3871	I3
3872	A3
3873	B5
3874	A4
3875	C2
3876	A4
3877	I3
3878	D1
3879	J2
3880	I2
3881	I2
3882	J3
3883	J2
3884	J2
3885	J3
3886	J3
3887	I3
3888	I3
3889	B5
3890	I3
3891	J3
3892	B5
3893	I3
3894	D3
3895	D5
3896	H3
3897	F1
3899	C2
5802	A2
5803	J1
5804	I1
5805	A2
6871	H4
6872	I4
6873	J4
6874	H3
6875	I3
6876	C1
6877	A3
6878	H4
7801	F1
7805	B3
7806	H3
7807	F5
7812	H3
7871	J2
7873	J4
7874	C2
7875	C1
7876	C5
7877	C4
9801	I4
9802	B4
9803	B2
9805	D1
9806	F2
9807	G5
9808	F1
9811	G1
9812	G1
9813	C1
9815	A2
9816	A2
9817	A2
9818	B1
9819	B2
9820	B2
9821	B2
9822	B2
9823	D1
9824	C2
9825	H1
9827	C1
9830	D1
9831	C4
9832	E5
9833	H1
9834	D1
9835	A1
9836	D5
9837	J3
9838	A1
9839	A1
9841	E5
9842	E5
9844	F4
9845	D5
9850	C2
9851	D5
9852	E5
9853	E4
9855	E3
9856	E3
9857	G2
9858	G2
9859	G3
9861	G5
9862	G5
9864	F3
9876	C1
9884	G3
9885	G2
9888	H4
9889	H4
9898	J1
9899	I1

3CDC99 Board Copperside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

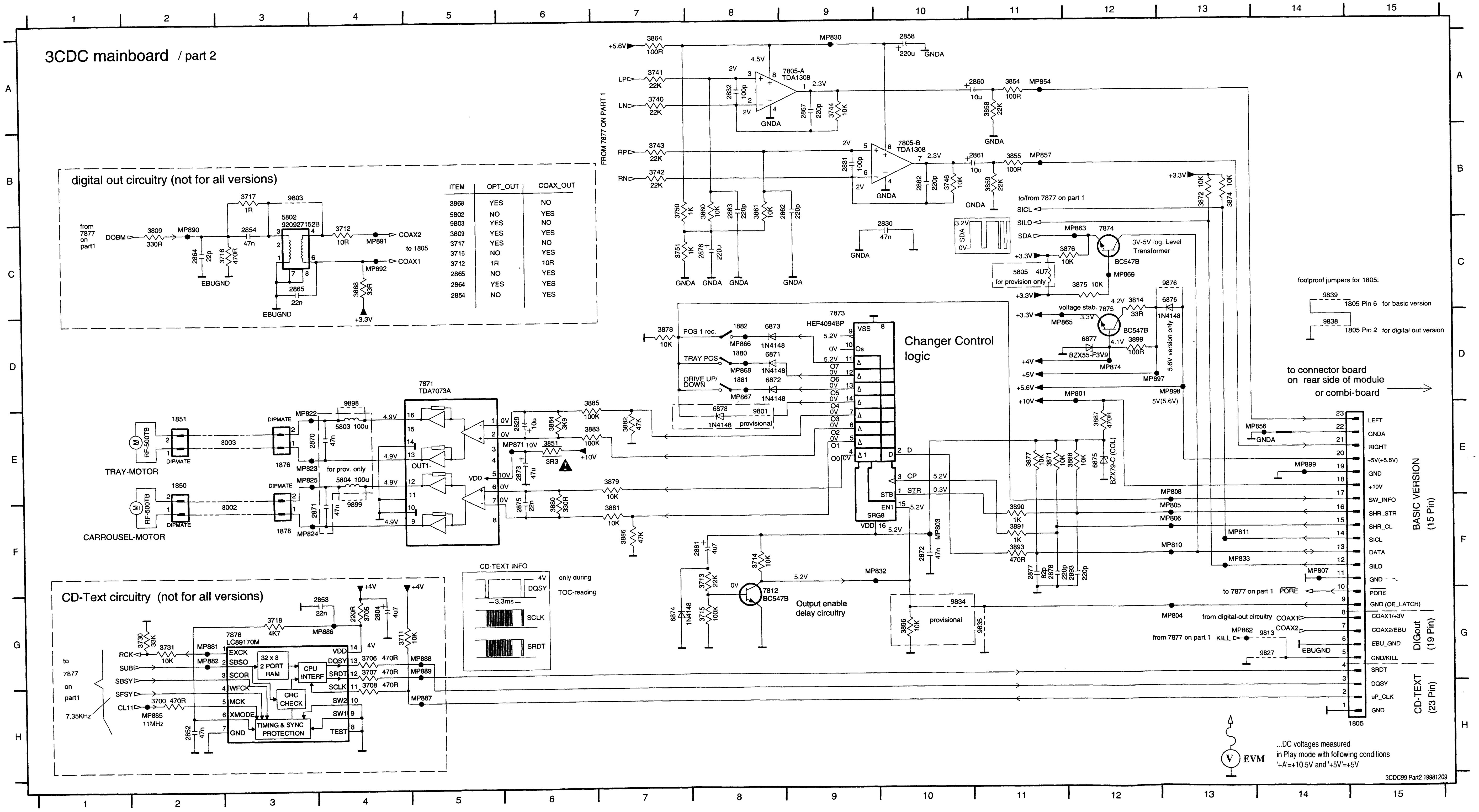
Transistor pinning



3CDC99 Layout stage 1 981205

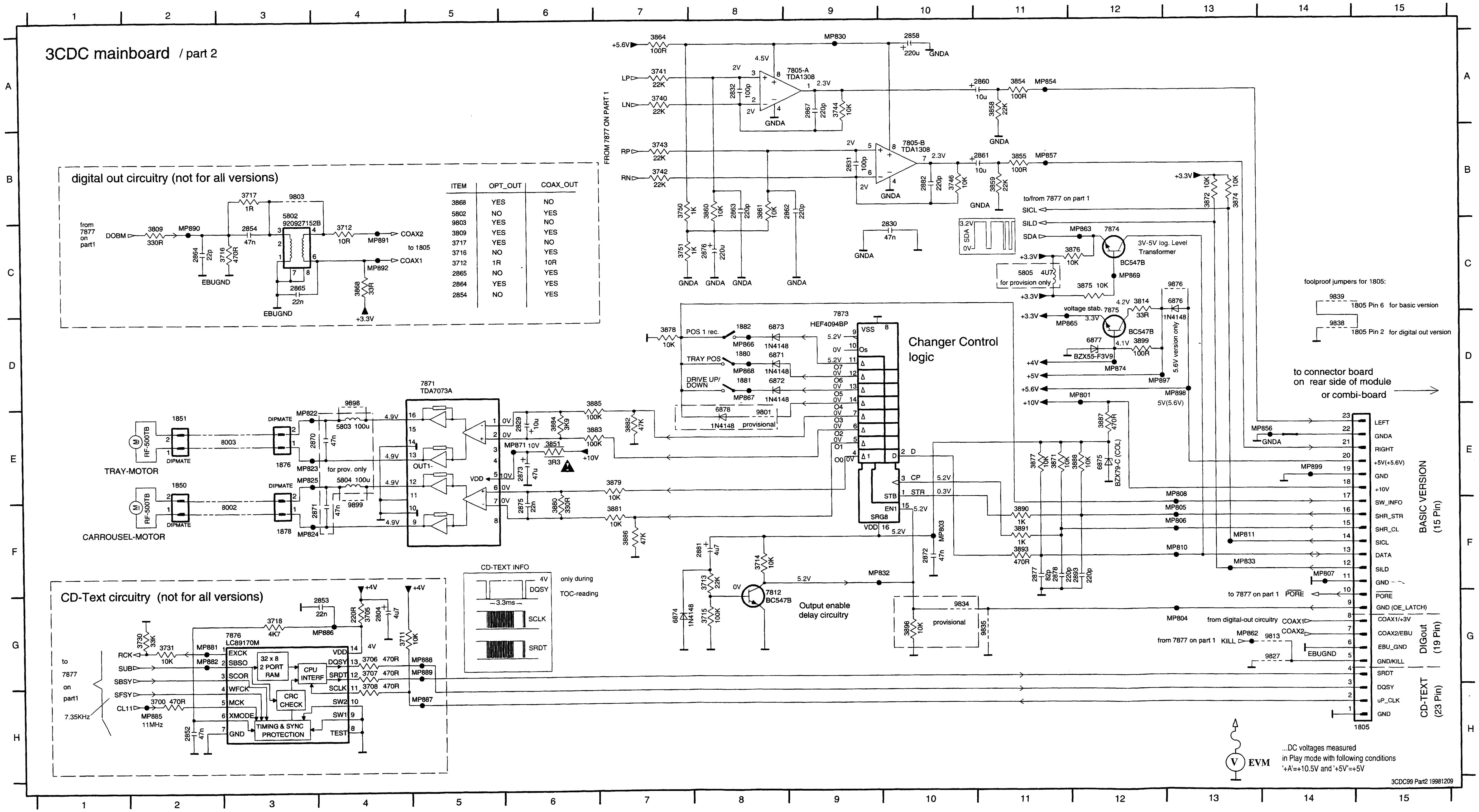
1805 H14	2804 G4	2853 G4	2863 B8	2872 F10	2881 F8	3707 G4	3715 G8	3740 A7	3750 B7	3855 B11	3868 C4	3877 E11	3883 E6	3890 F11	5803 E4	6874 G7	7805-B B10	7876 G3	9835 G11
1876 E3	2829 E6	2854 C3	2864 C2	2873 E6	2882 B10	3708 H4	3716 C3	3741 A7	3751 C7	3858 A11	3871 E11	3878 D7	3884 E6	3891 F11	5804 E4	6875 E12	7812 G8	9801 E8	9838 D14
1878 F3	2830 C10	2858 A10	2865 C3	2875 F6	2893 F12	3711 G4	3717 B3	3742 B7	3809 C2	3859 B11	3872 B13	3879 E7	3885 D6	3893 F11	5805 C11	6876 C13	7871 D5	9803 B3	9839 C14
1880 D8	2831 B9	2860 A11	2867 A9	2876 C8	3700 H2	3712 C4	3718 G3	3743 B7	3814 C12	3860 B8	3874 B13	3880 F6	3886 F7	3896 G10	6871 D8	6877 D12	7873 D9	9813 G14	9876 C13
1881 D8	2832 A8	2861 B11	2870 E3	2877 F11	3705 G4	3713 F8	3730 G2	3744 A9	3851 E6	3861 B8	3875 C12	3881 F7	3887 E12	3899 D12	6872 D8	6878 E8	7874 C12	9827 G14	9898 D4
1882 D8	2852 H2	2862 B8	2871 F4	2878 F11	3706 G4	3714 F8	3731 G2	3746 B10	3854 A11	3864 A7	3876 C12	3882 E7	3888 E12	5802 B3	6873 D8	7805-A A9	7875 D12	9834 G10	9899 E4

3CDC mainboard / part 2


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H
digital out circuitry (not for all versions)
from 7877 on part1
DOBM
3809 330R
MP890
2864 22p
3716 470R
EBUGND
3717 1R
9803
2854 47n
5802 9209271528
3712 10R
MP891
COAX2
to 1805
COAX1
MP892
2865 22n
3868 33R
+3.3V
FROM 7877 ON PART 1
+5.6V
3864 100R
MP830
2858 220u
GNDA
4.5V
LP
3741 22K
LN
3740 22K
2832 100p
7805-A TDA1308
2.3V
2867 220p
3744 10K
2V
GNDA
2860 10u
3854 100R
MP854
3858 22K
RP
3743 22K
RN
3742 22K
2831 100p
7805-B TDA1308
2882 220p
3746 10K
2861 10u
3855 100R
MP857
3859 22K
3750 1K
3751 1K
3860 10K
2876 220u
2863 220p
3861 10K
2862 220p
2830 47n
to/from 7877 on part 1
SICL
SILD
SDA
MP863
7874
3V-5V log. Level Transformer
BC547B
+3.3V
3876 10K
MP869
5805 4U7 for provision only
3875 10K
3872 10K
3874 10K
9876
3814 33R
6876 1N4148
voltage stab. 7875
MP865
BC547B
6877 BZX55-F3V9
3899 100R
MP874
+4V
+5V
+5.6V
+10V
MP897
MP898 5V(5.6V)
5.6V version only
MP801
foolproof jumpers for 1805:
9839 1805 Pin 6 for basic version
9838 1805 Pin 2 for digital out version
3878 10K
POS 1 rec.
1882
6873 1N4148
MP866
TRAY POS
1880
6871 1N4148
MP868
DRIVE UP/ DOWN
1881
6872 1N4148
MP867
6878 1N4148
9801 provisional
7873 HEF4094BP
Changer Control logic
VSS
STB
EN1
SRG8
VDD
CP
D
OS
5.2V
0.3V
MP803
2872 47n
7871 TDA7073A
1851
RF-500TB
DIPMATE
8003
TRAY-MOTOR
1876
MP822
9898
5803 100u
2870 47n
MP823
for prov. only
1850
8002
CARROUSEL-MOTOR
1878
MP825
5804 100u
9899
2871 47n
MP824
4.9V
OUT1-
VDD
2829 10u
3884 3K9
3885 100K
3882 47K
3883 100K
MP871 10V
3851 3R3
+10V
2873 47u
2875 22n
3880 330R
3879 10K
3881 10K
3886 47K
2881 4u7
3714 10K
3713 22K
3715 100K
6874 1N4148
7812 BC547B
Output enable delay circuitry
5.2V
MP832
3896 10K
9834 provisional
9835
3887 470R
6875 BZX79-C (COL)
3877 10K
3871 10K
3888 10K
3890 1K
3891 1K
3893 470R
2877 82p
2878 220p
2893 220p
MP808
MP805
MP806
MP810
MP811
MP833
MP807
MP856
GNDA
MP899
to connector board on rear side of module or combi-board
to 7877 on part 1 PORE
MP804
from digital-out circuitry COAX1
COAX2
MP862 9813
from 7877 on part 1 KILL
9827
EBUGND
1805
23 LEFT
22 GNDA
21 RIGHT
20 +5V(+5.6V)
19 GND
18 +10V
17 SW_INFO
16 SHR_STR
15 SHR_CL
14 SICL
13 DATA
12 SILD
11 GND
10 PORE
9 GND (OE_LATCH)
8 COAX1/+3V
7 COAX2/EBU
6 EBU_GND
5 GND/KILL
4 SRDT
3 DQSY
2 uP_CLK
1 GND
BASIC VERSION (15 Pin)
DIGout (19 Pin)
CD-TEXT (23 Pin)
CD-TEXT INFO
DQSY
4V
only during TOC-reading
3.3ms
SCLK
SRDT
CD-Text circuitry (not for all versions)
to 7877 on part1
RCK
SUB
SBSY
SFSY
CL11
7.35KHz
3730 33K
3731 10K
3700 470R
MP885 11MHz
2852 47n
7876 LC89170M
3718 4K7
2853 22n
MP881
MP882
EXCK
SBSO
SCOR
WFCK
MCK
XMODE
GND
32 x 8 2 PORT RAM
CPU INTERF
CRC CHECK
TIMING & SYNC PROTECTION
VDD
DQSY
SRDT
SCLK
SW2
SW1
TEST
MP886
3705 220R
2804 4u7
3711 10K
+4V
3706 470R
3707 470R
3708 470R
MP888
MP889
MP887
V EVM
...DC voltages measured in Play mode with following conditions '+A'=+10.5V and '+5V'=+5V
3CDC99 Part2 19981209

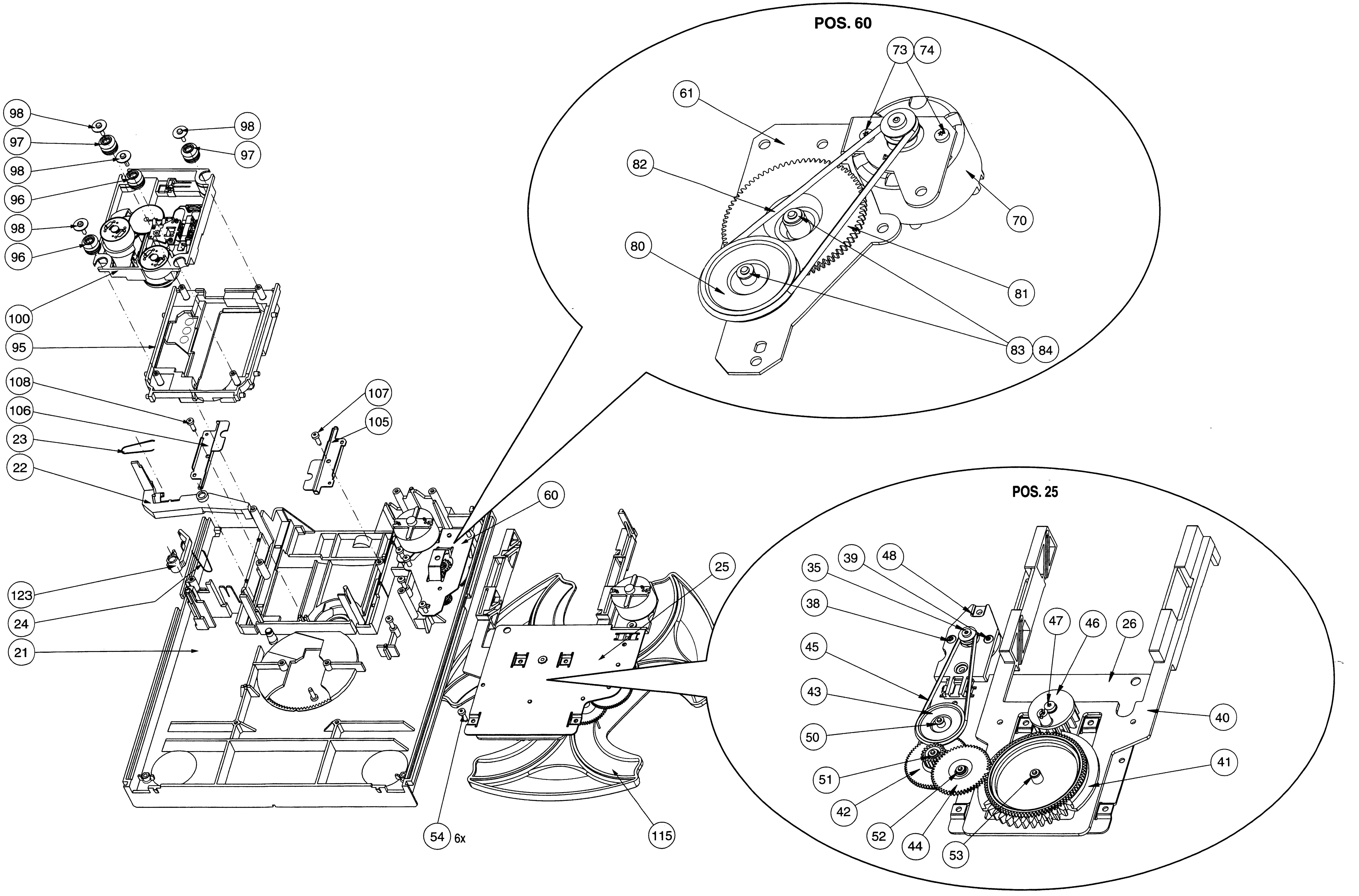
ITEM	OPT_OUT	COAX_OUT
3868	YES	NO
5802	NO	YES
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	1R	10R
2865	NO	YES
2864	YES	YES
2854	NO	YES

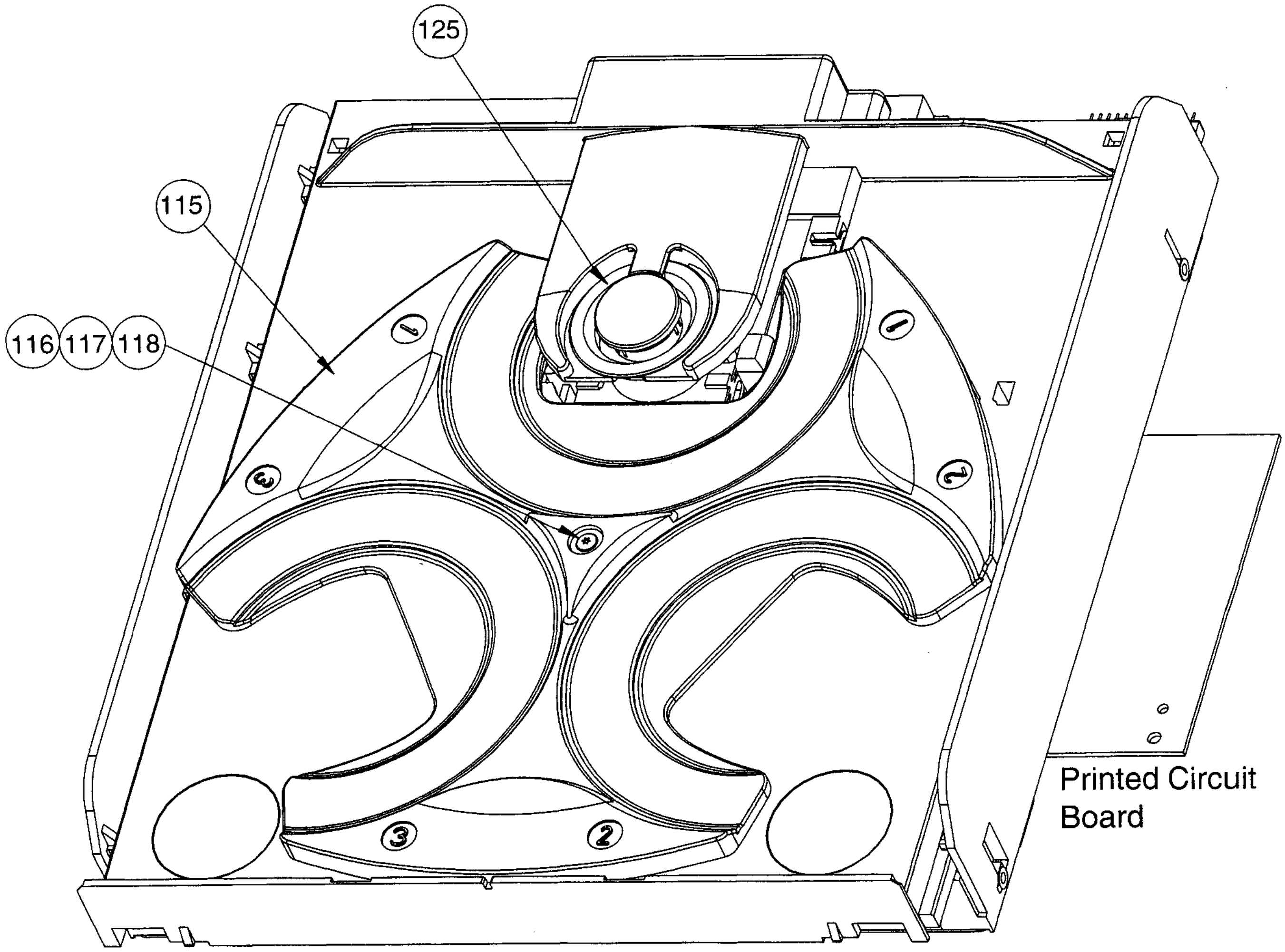
1805 H14	2804 G4	2853 G4	2863 B8	2872 F10	2881 F8	3707 G4	3715 G8	3740 A7	3750 B7	3855 B11	3868 C4	3877 E11	3883 E6	3890 F11	5803 E4	6874 G7	7805-B B10	7876 G3	9835 G11
1876 E3	2829 E6	2854 C3	2864 C2	2873 E6	2882 B10	3708 H4	3716 C3	3741 A7	3751 C7	3858 A11	3871 E11	3878 D7	3884 E6	3891 F11	5804 E4	6875 E12	7812 G8	9801 E8	9838 D14
1878 F3	2830 C10	2858 A10	2865 C3	2875 F6	2893 F12	3711 G4	3717 B3	3742 B7	3809 C2	3859 B11	3872 B13	3879 E7	3885 D6	3893 F11	5805 C11	6876 C13	7871 D5	9803 B3	9839 C14
1880 D8	2831 B9	2860 A11	2867 A9	2876 C8	3700 H2	3712 C4	3718 G3	3743 B7	3814 C12	3860 B8	3874 B13	3880 F6	3886 F7	3896 G10	6871 D8	6877 D12	7873 D9	9813 G14	9876 C13
1881 D8	2832 A8	2861 B11	2870 E3	2877 F11	3705 G4	3713 F8	3730 G2	3744 A9	3851 E6	3861 B8	3875 C12	3881 F7	3887 E12	3899 D12	6872 D8	6878 E8	7874 C12	9827 G14	9898 D4
1882 D8	2852 H2	2862 B8	2871 F4	2878 F11	3706 G4	3714 F8	3731 G2	3746 B10	3854 A11	3864 A7	3876 C12	3882 E7	3888 E12	5802 B3	6873 D8	7805-A A9	7875 D12	9834 G10	9899 E4


3CDC mainboard / part 2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H
digital out circuitry (not for all versions)
from 7877 on part1
DOBM
3809 330R
MP890
3717 1R
9803
2854 47n
5802 920927152B
3712 10R
MP891
COAX2
to 1805
COAX1
MP892
2864 22p
3716 470R
EBUGND
2865 22n
3868 33R
+3.3V
FROM 7877 ON PART 1
+5.6V
3864 100R
MP830
2858 220u
GNDA
LP
3741 22K
LN
3740 22K
4.5V
7805-A TDA1308
2V
2832 100p
2867 220p
3744 10K
2.3V
RP
3743 22K
RN
3742 22K
7805-B TDA1308
2831 100p
2882 220p
3746 10K
2860 10u
3854 100R
MP854
3858 22K
2861 10u
3855 100R
MP857
3859 22K
3750 1K
3860 10K
2863 220p
3861 10K
2862 220p
3751 1K
2876 220u
2830 47n
+3.3V
3872 10K
3874 10K
to/from 7877 on part 1
SICL
SILD
SDA
MP863
7874
3V-5V log. Level Transformer
BC547B
3876 10K
MP869
5805 4U7
for provision only
3875 10K
9876
6876 1N4148
3814 33R
voltage stab. 7875
MP865
BC547B
6877 BZX55-F3V9
3899 100R
MP874
5.6V version only
+4V +5V +5.6V +10V
MP897
MP801
MP898 5V(5.6V)
3887 470R
6875 BZX79-C (COL)
foolproof jumpers for 1805:
9839 1805 Pin 6 for basic version
9838 1805 Pin 2 for digital out version
to connector board on rear side of module or combi-board
7873 HEF4094BP
Changer Control logic
3878 10K
POS 1 rec.
1882 MP866
6873 1N4148
TRAY POS
1880 MP868
6871 1N4148
DRIVE UP/ DOWN
1881 MP867
6872 1N4148
6878 1N4148
9801 provisional
VSS D CP STR STB EN1 SRG8 VDD
7871 TDA7073A
1851 RF-500TB
DIPMATE
8003
TRAY-MOTOR
1876
MP822 9898 5803 100u
2870 47n
MP823 for prov. only
MP825 5804 100u
1850 RF-500TB
8002
CARROUSEL-MOTOR
1878
2871 47n
9899
MP824
OUT1-
VDD
2829 10u
3884 3K9
3885 100K
3882 47K
3883 100K
MP871 10V 3851 3R3
2873 47u
2875 22n
3880 330R
3879 10K
3881 10K
3886 47K
2881 4u7
3714 10K
3713 22K
MP832
7812 BC547B
Output enable delay circuitry
6874 1N4148
3715 100K
2872 47n
MP803
9834 provisional
3896 10K
9835
3890 1K
3891 1K
3893 470R
3877 10K
3871 10K
3888 10K
2877 82p
2878 220p
2893 220p
MP808 MP805 MP806 MP810
MP811 MP833
MP856 GNDA
MP899
MP807
to 7877 on part 1 PORE
MP804
from digital-out circuitry COAX1 COAX2
MP862 9813
from 7877 on part 1 KILL
9827
EBUGND
LEFT GNDA RIGHT +5V(+5.6V) GND +10V SW_INFO SHR_STR SHR_CL SICL DATA SILD GND PORE GND (OE_LATCH) COAX1/+3V COAX2/EBU EBU_GND GND/KILL SRDT DQSY uP_CLK GND
1805
BASIC VERSION (15 Pin)
DIGout (19 Pin)
CD-TEXT (23 Pin)
CD-TEXT INFO
only during TOC-reading
4V 0V DQSY
3.3ms
SCLK
SRDT
CD-Text circuitry (not for all versions)
to 7877 on part1
RCK SUB SBSY SFSY CL11
7.35KHz
3730 33K
3731 10K
3718 4K7
2853 22n
7876 LC89170M
MP881 MP882
EXCK SBSO SCOR WFCK MCK XMODE GND
32 x 8 2 PORT RAM
CPU INTERF
CRC CHECK
TIMING & SYNC PROTECTION
VDD DQSY SRDT SCLK SW2 SW1 TEST
3705 220R
2804 4u7
3711 10K
+4V
3706 470R
3707 470R
3708 470R
MP888 MP889 MP887
MP886
3700 470R
MP885 11MHz
2852 47n
EVM
3CDC99 Part2 19981209

ITEM	OPT_OUT	COAX_OUT
3868	YES	NO
5802	NO	YES
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	1R	10R
2865	NO	YES
2864	YES	YES
2854	NO	YES

...DC voltages measured
in Play mode with following conditions
'+A'=+10.5V and '+5V'=+5V

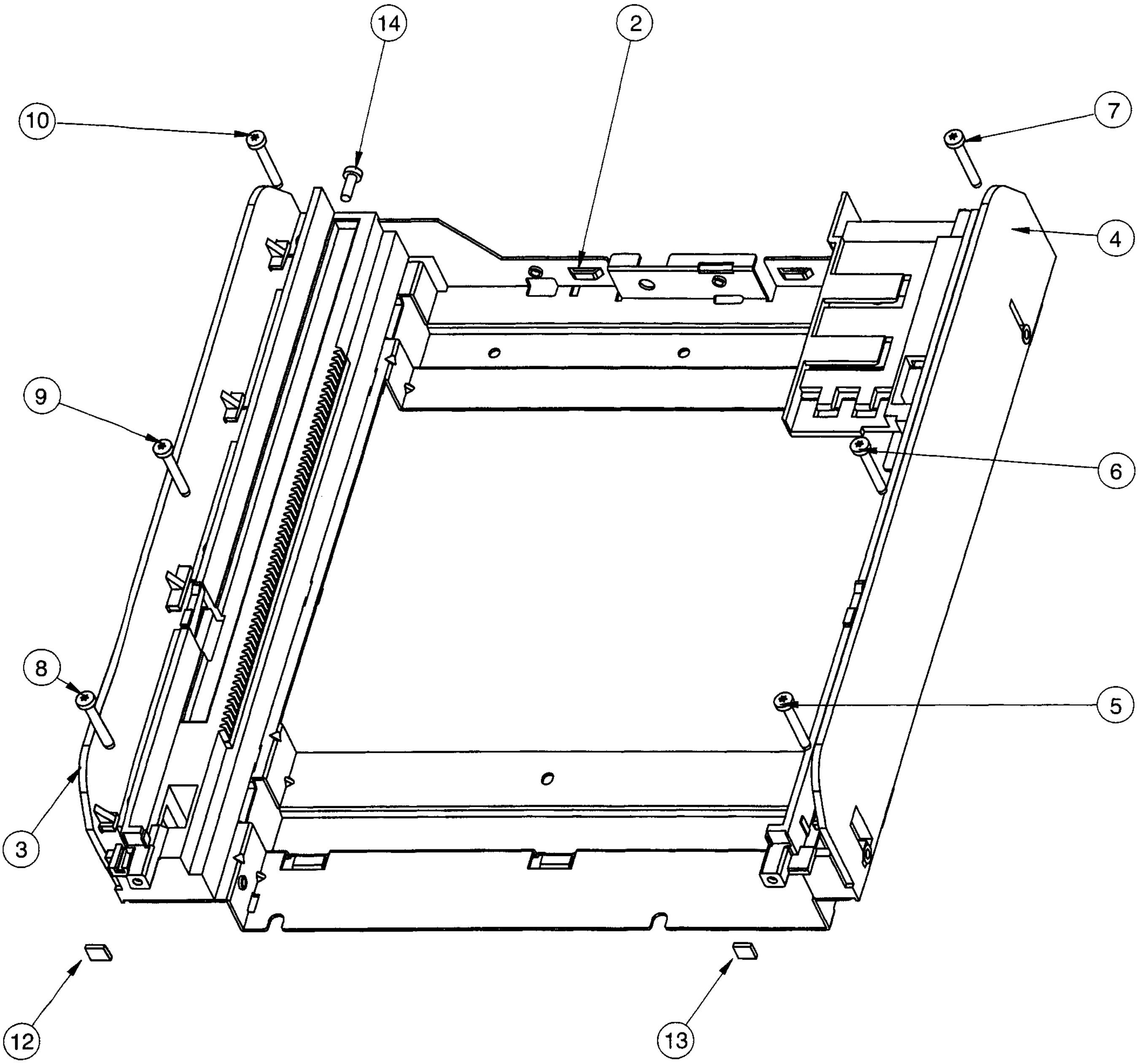

POS. 60
6x
POS. 25



MECHANICAL PARTSLIST 3CDC-99 MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)
3	4822 463 11008	GUIDE LEFT
4	4822 463 11009	GUIDE RIGHT
21	4822 441 11615	DRAWER
22	4822 402 10088	BRACKET TUMBLER
38	4822 502 12548	SCREW M2,6X3,5
39	4822 502 12548	SCREW M2,6X3,5
40	4822 463 11011	SLIDE
41	4822 522 10509	CONTROL DISC
42	4822 522 10492	GEAR WHEEL
43	4822 528 10937	PULLEY
44	4822 522 10493	IDLER WHEEL
45	4822 358 10115	BELT
46	4822 466 10735	ECCENTRIC GEAR WHEEL
50	4822 532 12364	WASHER
51	4822 532 12364	WASHER
52	4822 532 12364	WASHER
53	4822 532 12364	WASHER
35	4822 361 10753	CARROUSEL MOTOR
70	4822 361 10753	CARROUSEL MOTOR

continued on next page



MECHANICAL PARTSLIST 3CDC-99 MODULE

73	4822 502 12548	SCREW M2,6X3,5
74	4822 502 12548	SCREW M2,6X3,5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10895	SUPPORT
96	4822 529 10431	SUSPENSION
97	4822 529 10431	SUSPENSION
100	4822 691 10772	CD DRIVE VAM2201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
123	4822 402 11237	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP

ELECTRICAL PARTSLIST 3CDC-99 MODULE

MISCELLANEOUS

1800	4822 265 10925	FLEX FOIL CONNECTOR 15PIN
1805	4822 265 11533	FLEX FOIL CONNECTOR 23PIN
1805	4822 267 51322	FLEX FOIL CONNECTOR 15 PIN
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 124 40246	4,7µF	20%	63V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12787	330pF	10%	50V
2808	4822 122 10466	220pF	10%	50V
2809	5322 124 41948	0,47µF	20%	50V
2810	4822 126 10053	180pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2814	4822 126 12785	47nF	20%	50V
2815	4822 126 12882	100nF	20%	50V
2816	4822 126 12878	1,5nF	10%	16V
2818	4822 126 12878	1,5nF	10%	16V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12785	47nF	20%	50V
2826	4822 124 80231	47µF	20%	16V
2828	4822 124 40433	47µF	20%	25V
2829	4822 124 21732	10µF	20%	25V
2830	4822 126 12785	47nF	20%	50V
2831	4822 122 33195	100pF	10%	50V
2832	4822 122 33195	100pF	10%	50V
2833	4822 122 33069	33pF	5%	50V
2834	4822 122 33069	33pF	5%	50V
2835	4822 126 12785	47nF	20%	50V
2837	4822 124 40433	47µF	20%	25V
2838	4822 124 41579	10µF	20%	50V
2839	4822 124 40433	47µF	20%	25V
2840	4822 126 12882	100nF	20%	50V
2841	4822 126 12702	270pF	10%	50V
2842	4822 126 12339	2,2nF	10%	16V
2844	4822 126 12702	270pF	10%	50V
2849	4822 124 40246	4,7µF	20%	63V
2850	4822 122 33197	1nF	10%	50V
2851	4822 124 40196	220µF	20%	16V
2852	4822 126 12785	47nF	20%	50V
2853	4822 126 11585	22nF	20%	50V
2854	4822 126 12785	47nF	20%	50V
2855	4822 122 33519	470pF	10%	50V
2856	4822 122 33848	47pF	5%	50V
2857	4822 121 51387	10nF	20%	16V
2858	4822 124 40196	220µF	20%	16V
2859	4822 121 51387	10nF	20%	16V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 122 10466	220pF	10%	50V
2863	4822 122 10466	220pF	10%	50V
2864	4822 122 33191	22pF	5%	50V
2865	4822 126 11585	22nF	20%	50V
2867	4822 122 10466	220pF	10%	50V
2869	4822 126 12785	47nF	20%	50V

CAPACITORS

2872	4822 126 12785	47nF	20%	50V
2873	4822 124 12233	47µF	20%	25V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 40196	220µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 126 12785	47nF	20%	50V
2882	4822 122 10466	220pF	10%	50V
2884	4822 124 40246	4,7µF	20%	63V
2885	4822 124 40246	4,7µF	20%	63V
2887	4822 126 12882	100nF	20%	50V
2888	4822 124 40246	4,7µF	20%	63V
2891	4822 122 10576	1,8nF	10%	16V
2892	4822 126 11714	4,7nF	20%	16V
2893	4822 122 10466	220pF	10%	50V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 83872	220Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3709	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3712	4822 116 52176	10Ω	5%	0,5W
3713	4822 116 52257	22kΩ	5%	0,5W
3714	4822 116 83864	10kΩ	5%	0,5W
3715	4822 116 52234	100kΩ	5%	0,5W
3716	4822 116 83883	470Ω	5%	0,16W
3718	4822 116 52283	4,7kΩ	5%	0,5W
3727	4822 116 52283	4,7kΩ	5%	0,5W
3728	4822 116 52283	4,7kΩ	5%	0,5W
3730	4822 116 52271	33kΩ	5%	0,16W
3731	4822 116 83864	10kΩ	5%	0,5W
3740	4822 116 52257	22kΩ	5%	0,5W
3741	4822 116 52257	22kΩ	5%	0,5W
3742	4822 116 52257	22kΩ	5%	0,5W
3743	4822 116 52257	22kΩ	5%	0,5W
3744	4822 116 83864	10kΩ	5%	0,5W
3746	4822 116 83864	10kΩ	5%	0,5W
3750	4822 050 11002	1kΩ	5%	0,2W
3751	4822 050 11002	1kΩ	5%	0,2W
3800	4822 116 52291	56kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52291	56kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 83876	270Ω	5%	0.16W
3811	4822 116 52251	18kΩ	5%	0,5W
3812	4822 053 10228	2,2Ω	5%	1W
3814	4822 116 52191	33Ω	5%	0,5W
3815	4822 052 10478	4,7Ω	5%	NFR
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52283	4,7kΩ	5%	0,5W
3821	4822 116 52283	4,7kΩ	5%	0,5W
3822	4822 116 52249	1,8kΩ	5%	0,16W
3823	4822 050 11002	1kΩ	5%	0,2W
3824	4822 050 11002	1kΩ	5%	0,2W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52271	33kΩ	5%	0,16W

ELECTRICAL PARTSLIST 3CDC-99 MODULE

RESISTORS

3828	4822 116 52257	22kΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83864	10kΩ	5%	0,5W
3833	4822 116 52257	22kΩ	5%	0,5W
3834	4822 116 52257	22kΩ	5%	0,5W
3835	4822 052 10338	3,3Ω		NFR25
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52234	100kΩ	5%	0,5W
3840	4822 116 52234	100kΩ	5%	0,5W
3841	4822 116 52283	4,7kΩ	5%	0,5W
3842	4822 116 83884	47kΩ	5%	0,16W
3843	4822 116 52271	33kΩ	5%	0,16W
3844	4822 116 52283	4,7kΩ	5%	0,5W
3845	4822 116 83884	47kΩ	5%	0,16W
3846	4822 116 52271	33kΩ	5%	0,16W
3847	4822 116 83961	6,8kΩ	5%	0,16W
3848	4822 116 52234	100kΩ	5%	0,5W
3849	4822 116 52234	100kΩ	5%	0,5W
3850	4822 116 52276	3,9kΩ	5%	0,5W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	4822 116 83883	470Ω	5%	0,16W
3854	4822 116 52175	100Ω	5%	0,5W
3855	4822 116 52175	100Ω	5%	0,5W
3857	4822 116 52191	33Ω	5%	0,5W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83864	10kΩ	5%	0,5W
3861	4822 116 83864	10kΩ	5%	0,5W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52191	33Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3866	4822 116 83864	10kΩ	5%	0,5W
3867	4822 116 83868	150Ω	5%	0,5W
3869	4822 050 24708	4,7Ω	1%	0,6W
3870	4822 116 52175	100Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83864	10kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W
3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 116 83883	470Ω	5%	0,16W
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 050 11002	1kΩ	5%	0,2W
3891	4822 050 11002	1kΩ	5%	0,2W
3892	4822 116 83883	470Ω	5%	0,16W
3893	4822 116 83883	470Ω	5%	0,16W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3897	4822 116 52175	100Ω	5%	0,5W
3899	4822 116 52175	100Ω	5%	0,5W

COILS

1810	4822 242 10849	QUARTZ 8,46MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5802	4822 156 31058	FILTER DIGITAL OUT

DIODES

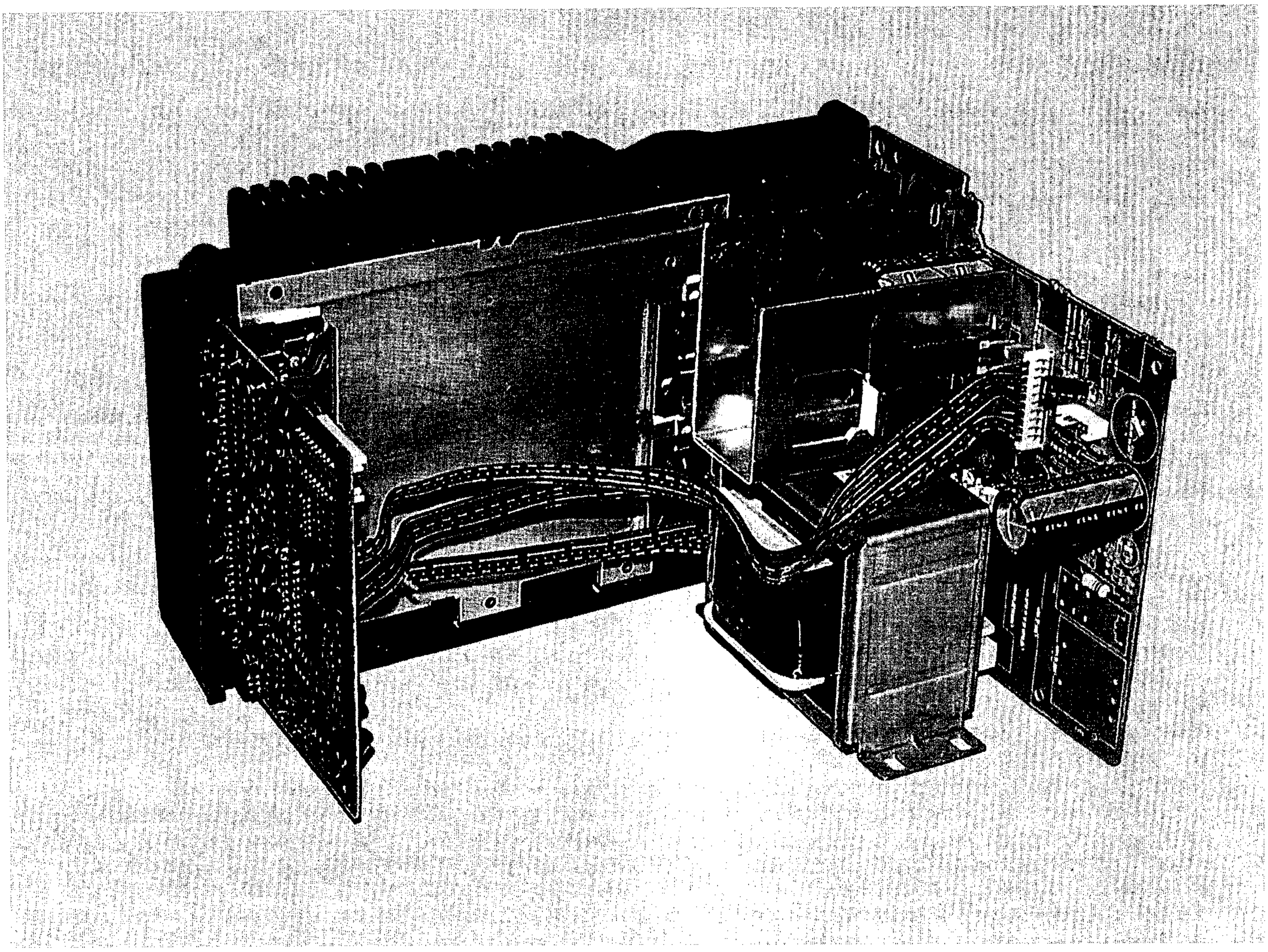
6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1
6877	4822 130 31981	BZX79-C3V9

TRANSISTORS

7812	4822 130 40959	BC547B
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7801 ©	4822 209 17286	TZA1024T/N1 HF-AMPLIFIER
7805	4822 209 17284	TDA1308 OPAMP
7806	4822 209 32852	TDA7073A/N2 SERVO DRIVER
7807	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7871	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7873	5322 209 10421	HEF4094BP SHIFT REGISTER
7876 ©	4822 209 16143	LC89170M CD TEXT
7877 ©	4822 209 17285	SAA7324H/M1 SIGNAL PROCESSOR



POWER 4-99 Module

(4 Channel Version)

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CENTER/SURROUND PART

Component layout 11-10
Circuit diagram 11-11
Partslist...11-12

CIRCUIT DESCRIPTION FOR POWER4-MODULE

Supply-part

General *(pos. numbers refer to circuit diagram chapter 11-7)*

The primary circuitry depends on the version:

- Versions with fixed primary voltage: 100VAC for /26
  120VAC for /37
  220-240VAC for /22/25/30/33/34
  Versions /22/25/26/37 use radial type-fuse 1201, versions /30/33/34 use glass tube fuse 1202.
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- Version with switchable primary voltage: 110-127/220-240VAC for /21
  In version /21 voltage selector 1210 is built-in and each primary winding is protected separately (fuses 1201 and 1200).
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- European versions – "*low power standby feature*"
  For detailed description see below.

Circuit details:

- **Low power standby feature**

  An additional small standby transformer, connected in series to the mains transformer, reduces power consumption in standby-mode.
  In case power is switched on, the control line ECO is low → relay 1208 is activated → standby transformer 5211 is shortened and out of work.
  When the set is switched off (standby) the control line ECO is high → relay 1208 is not activated → standby transformer 5211 is now connected in series to the primary winding of the mains transformer 1008. As the impedance of the standby transformer is much higher than the impedance of the mains transformer, the mainsvoltage is divided by approx. 85% (standby transformer) to 15% (mains transformer). Thus the mains transformer delivers very low secondary voltage → power consumption is less than 100mW.
  Via standby transformer and rectifiers 6209-6212 the supply voltage +C is substituted. The 5,6V regulator is still working and so the microprocessor is kept running.

- **DC voltages +A, +B1/+B2, +C**

  These voltages supply the Super Class G amplifier, described later in this chapter.
  The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several "tricky" details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

  Generation of +A

  Common full wave rectifying with bridge rectifier 6201, using 100% secondary winding of mains transformer (pin 11-15).

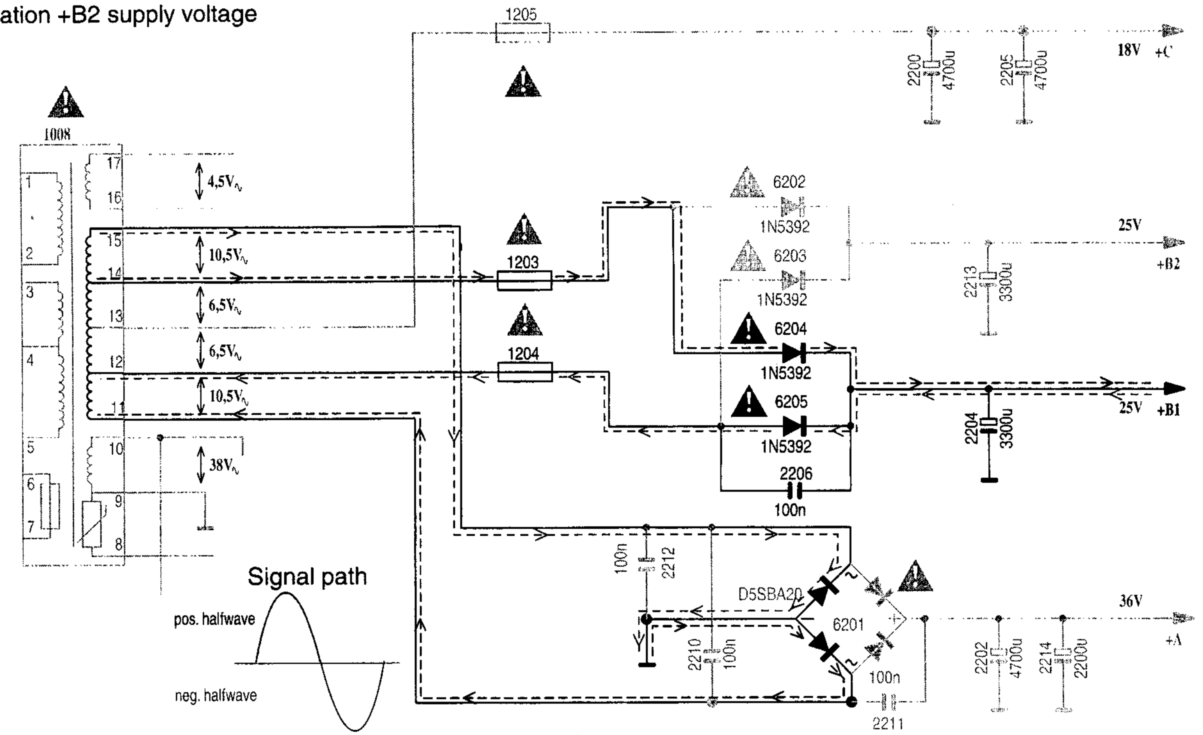
  Generation of +B1/+B2

  The power supply is designed to cover both, 2-channel and 4-channel application.
  While for 2-channel application only one supply voltage +B1 is sufficient, 4-channel application requires an additional supply part +B2 which supplies the Center/Surround-amplifiers and the +12V-regulator (current required by 4 amplifiers would overload a single rectifier).

  The supply for 2-channel versions consists of one full wave rectifier:
  – 2 diodes of bridge rectifier 6201, with 6204/6205 for generation of +B1
  – +B2 is connected in parallel with a bridge wire.

  The supply for 4-channel versions consists of two separate full wave rectifiers:
  – 2 diodes of bridge rectifier 6201, with 6204/6205 (for +B1) and
  – 2 diodes of bridge rectifier 6201, with 6202/6203 (for +B2),
  using approx. 70% secondary winding of mains transformer (pin 11-14 respectively pin 12-15).
  As example for generation of +B2 see picture 1.

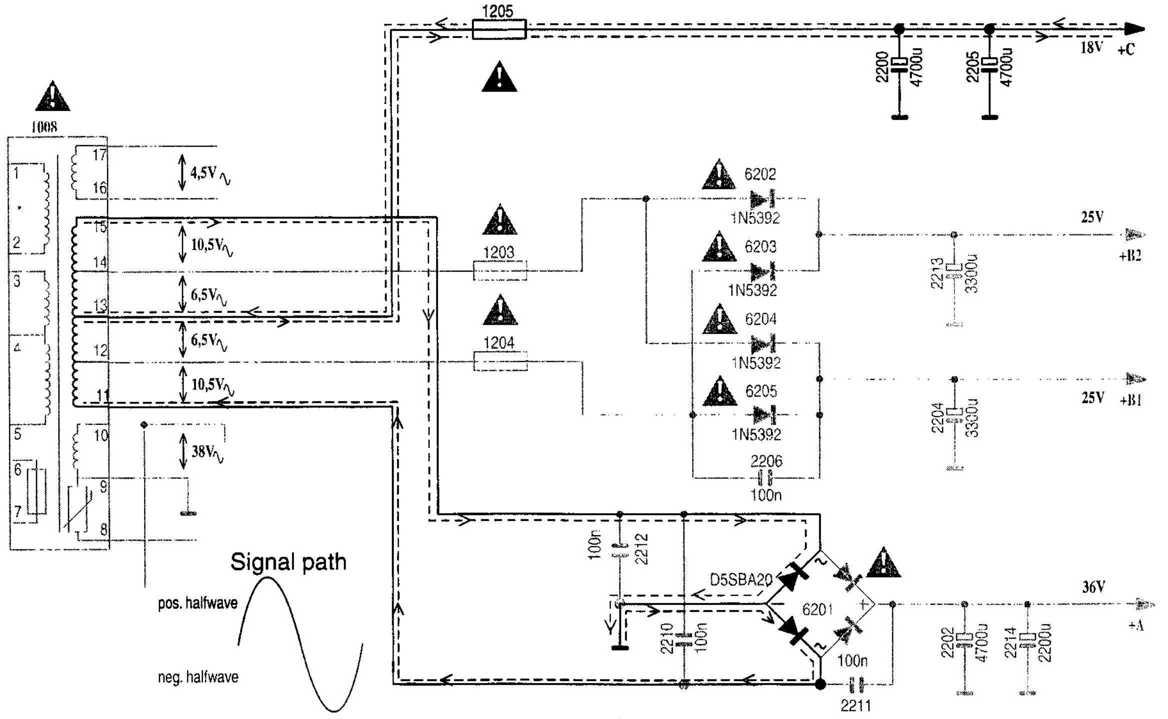
Generation +B2 supply voltage


1205
18V +C
2200 4700u
2205 4700u
1008
17
16
15
14
13
12
11
10
9
8
1
2
3
4
5
6
7
4,5V∿
10,5V∿
6,5V∿
6,5V∿
10,5V∿
38V∿
6202 1N5392
6203 1N5392
6204 1N5392
6205 1N5392
1203
1204
25V +B2
2213 3300u
25V +B1
2204 3300u
2206 100n
100n 2212
D5SBA20
6201
2210 100n
100n 2211
36V +A
2202 4700u
2214 2200u
Signal path
pos. halfwave
neg. halfwave

picture 1

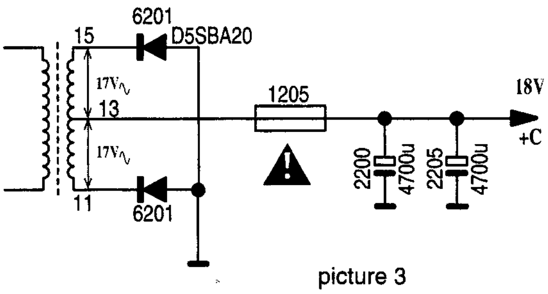
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.


1205
18V +C
2200 4700u
2205 4700u
1008
17
16
15
14
13
12
11
10
9
8
1
2
3
4
5
6
7
4,5V∿
10,5V∿
6,5V∿
6,5V∿
10,5V∿
38V∿
6202 1N5392
6203 1N5392
6204 1N5392
6205 1N5392
1203
1204
25V +B2
2213 3300u
25V +B1
2204 3300u
2206 100n
100n 2212
D5SBA20
6201
2210 100n
100n 2211
36V +A
2202 4700u
2214 2200u
Signal path
pos. halfwave
neg. halfwave

picture 2

Simplified


6201
D5SBA20
15
17V∿
13
17V∿
11
6201
1205
18V
+C
2200 4700u
2205 4700u

picture 3

Circuit details (continoued):

- **Supply voltages for FTD** (**F**luorescent **T**ube **D**isplay)
  The FTD requires two supply voltages, delivered by separate windings of the mains transformer:
  - 4,5VAC for FTD heating (transformer pin 16/17)
  - -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**
  Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.
  Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**
  The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**
  In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line.
  In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a save shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part

+12V-regulator *(pos. numbers refer to circuit diagram chapter 11-9)*

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**
  Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF
  If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch trough and supply the base of 7221. Consequently 7221 swiches trough too.
  Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

  If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**
  Key components are power-transistor 7221, reference diode 6221 and transistor 7223.
  After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).
  In normal operating mode 7227 is always switched trough as described above.

- **Protections:**
  In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.
  Restarting is only possible with power OFF→ ON.

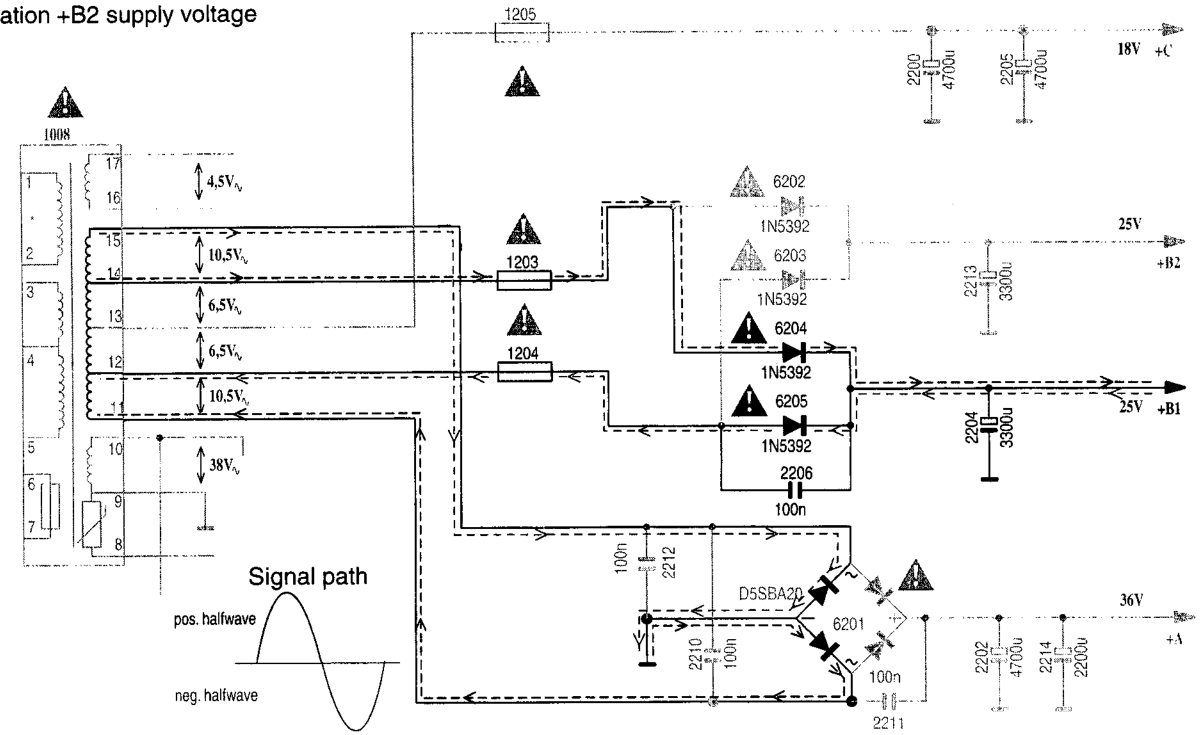
  In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

  These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.
  Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

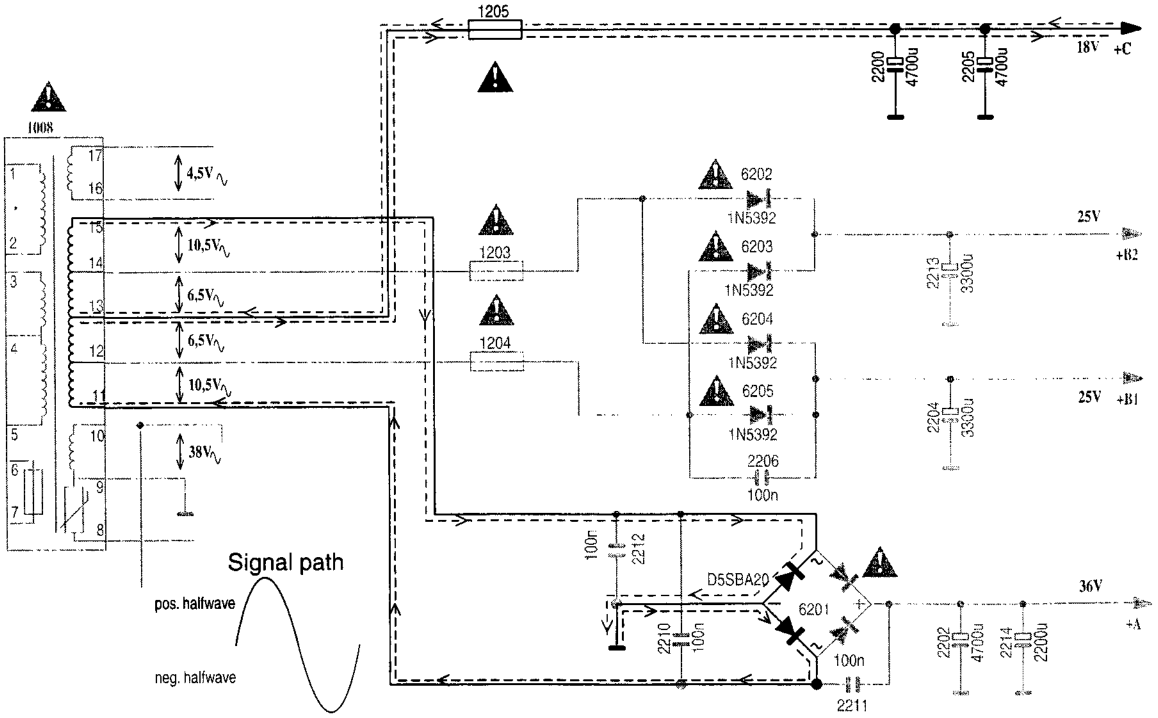
Generation +B2 supply voltage


1205
1008
17
16
15
14
13
12
11
10
9
8
1
2
3
4
5
6
7
4,5V∿
10,5V∿
6,5V∿
6,5V∿
10,5V∿
38V∿
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
2200
4700u
2205
4700u
18V +C
25V
+B2
2213
3300u
2204
3300u
25V +B1
100n
2212
D5SBA20
6201
2210
100n
100n
2211
36V
+A
2202
4700u
2214
2200u
Signal path
pos. halfwave
neg. halfwave

picture 1

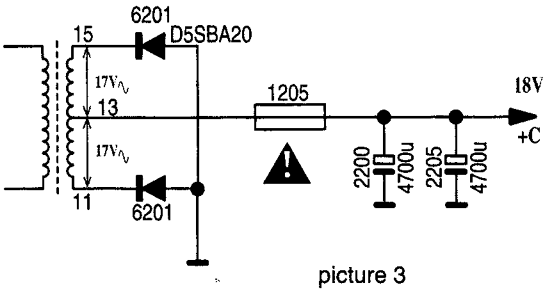
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.


1205
18V +C
2200
4700u
2205
4700u
1008
17
16
15
14
13
12
11
10
9
8
1
2
3
4
5
6
7
4,5V∿
10,5V∿
6,5V∿
6,5V∿
10,5V∿
38V∿
1203
1204
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
2206
100n
25V
+B2
2213
3300u
25V +B1
2204
3300u
100n
2212
D5SBA20
6201
2210
100n
100n
2211
36V
+A
2202
4700u
2214
2200u
Signal path
pos. halfwave
neg. halfwave

picture 2

Simplified


6201
D5SBA20
15
17V∿
13
17V∿
11
6201
1205
18V
+C
2200
4700u
2205
4700u

picture 3

Circuit details (continoued):

- **Supply voltages for FTD** (**F**luorescent **T**ube **D**isplay)
  The FTD requires two supply voltages, delivered by separate windings of the mains transformer:
  - 4,5VAC for FTD heating (transformer pin 16/17)
  - -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**
  Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.
  Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**
  The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**
  In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line.
  In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a save shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part

+12V-regulator *(pos. numbers refer to circuit diagram chapter 11-9)*

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**
  Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF
  If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch trough and supply the base of 7221. Consequently 7221 swiches trough too.
  Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

  If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**
  Key components are power-transistor 7221, reference diode 6221 and transistor 7223.
  After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).
  In normal operating mode 7227 is always switched trough as described above.

- **Protections:**
  In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.
  Restarting is only possible with power OFF→ ON.

  In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

  These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.
  Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

Circuit details (continoued):

VCD- Supply:

Is a provision for versions with a Video CD Player.

This circuitry consists of a switched supply with a regulator to 5,1V (±0,15V).

- **Switching on/off** is done via the VCD_ON line from the microprocessor (H=on, L=off). If the VCD_ON line is high - transistor 7236 becomes conductive. This causes transistor 7238 to switch through. +5VCD is available. If the VCD_ON is low - transistor 7236 is blocked → no base current through 7238 → transistor 7238 is blocked too → +5VCD is switched off.

- **Regulation** is done via Z- diode 6244 and transistor 7237. If the +5VCD exceeds 5,1V the basis of transistor 7237 becomes higher than 0,6V via Z- diode 6244. Consequently transistor 7237 becomes conductive. This causes a reduced base current through 7236. Transistor 7236 becomes less conductive and reduces the base current trough 7238. Transistor 7238 becomes less conductive too and reduces the +5VCD.

Amplifier:

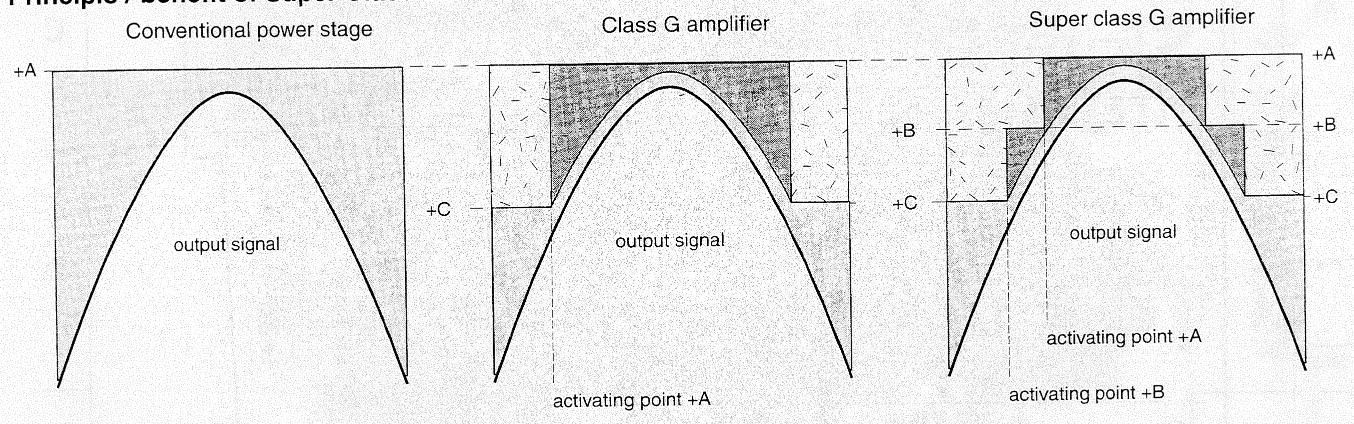
Attention: In the POWER 4 module the power amplifier IC AN7164 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the µP.
  High level (approx. 4,5V): power amplifiers switched on
  Low level (approx. 0V): power amplifiers switched off

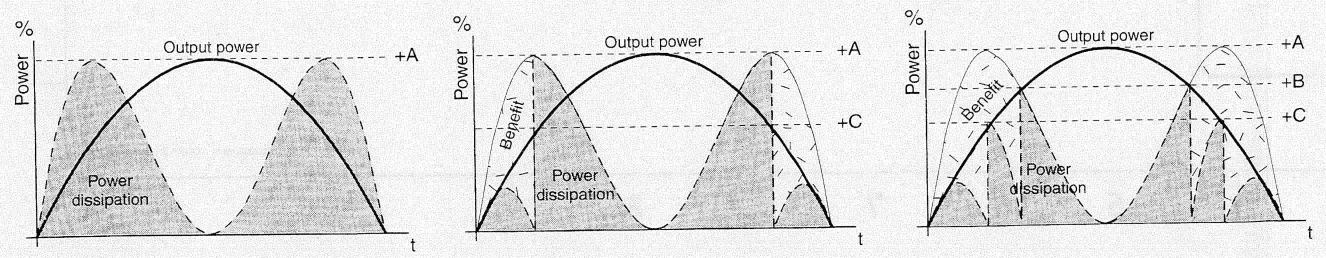
- Super class G - operation

  The power amplifiers operate as so-called super class G - amplifiers:
  The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
  Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
  ⇒ +C (+18V) for low output power
  ⇒ +B (+25V) for medium output power
  ⇒ +A (+36V for high output power

Principle / benefit of Super Class G



▢ Voltage drop on power stage IC
▨ Voltage drop on switching transistor(s)
⬚ Benefit - voltage drop on switching transistor(s) reduces total power dissipation



- advantages: - best efficiency
  - less power drawn from the mains transformer than by conventional operating amplifiers reduces transformer heating.
  - reduced power dissipation at the amplifier ICs results in
    - less junction temperature and better reliability
    - possibility of higher output power with smaller cooling fin
    - smaller size

- Functional description of the super class G - circiuitry used in Power4-module

  The DC-level on the amplifier output pins is normally Vcc/2.
  With low signals +C is supplying the amplifiers via decoupling diode 6312. The DC-level on the output pins is therefore approx. 8,6V and approx. 8V on the base of 7315.
  When the output signal increases, also DC-level on base of 7315 increases via diodes 6305, 6306, 6307 and 6308. At a certain output power 7315 becomes slightly conductive and enables low base current for 7304 which becomes conductive too and pulls gate of FET 7303 up to a more positive level. Thus FET 7303 begins to switch through and connects the higher DC supply +B1 slowly to the power stages.
  This does not end up in a hard switching but in a smooth regulating because Vcc is coupled back to the emitter of 7315 via Zener diode 6310. As soon as Vcc increases also the level on emitter 7315 is increased by a 3,9V lower level than Vcc.
  When the output power is increased further +B1 would not be high enough to enable undistorted output signal. The more the output level increases the more increases the DC-level on base of 7315 which causes the transistor more and more conducting until the summary of the voltage drop on 3340+E/B 7304+3342 becomes approx. 1,4V. Now the necessary VBE for a darlington-type transistor is obtained, 7305 begins to switch through and connects the again higher DC supply +A slowly to the power stages. 7305 regulates +A, same as described before for +B.
  7322 and 7316 switch the ripple capacitor 2355, dependent on the output power.
  With low output power the DC-level on base 7322 is approx. 8V. Via Zener diode 6310 and resistor 3333 the emitter is pulled to Vcc (+C at low levels). 7322 is switched through and in turn 7316. The ripple capacitor 2325 is connected to ground and functions as in normal amplifiers. Hum is suppressed and good S/N-ratio is guaranteed even during silent music passages.
  When the supply voltage has to be switched to a higher level the DC-level of the ripple capacitor has to increase in the same relation, otherwise the reference voltages inside the IC would not fit to the actual Vcc. Because of the different delays this relation cannot be obtained and a continuously connected capacitor to the ripple input would cause distortion. For that reason the ripple capacitor 2325 is disconnected as soon as the output power exceeds a certain value. When the output signal increases, also DC-level on base of 7322 increases via diodes 6305, 6306, 6307 and 6308. 7322 blocks and in turn 7316. The ripple capacitor 2325 is disconnected from ground. The circuitry is designed so that 2325 is disconnected just before 7303 begins to switch +B through (see above).

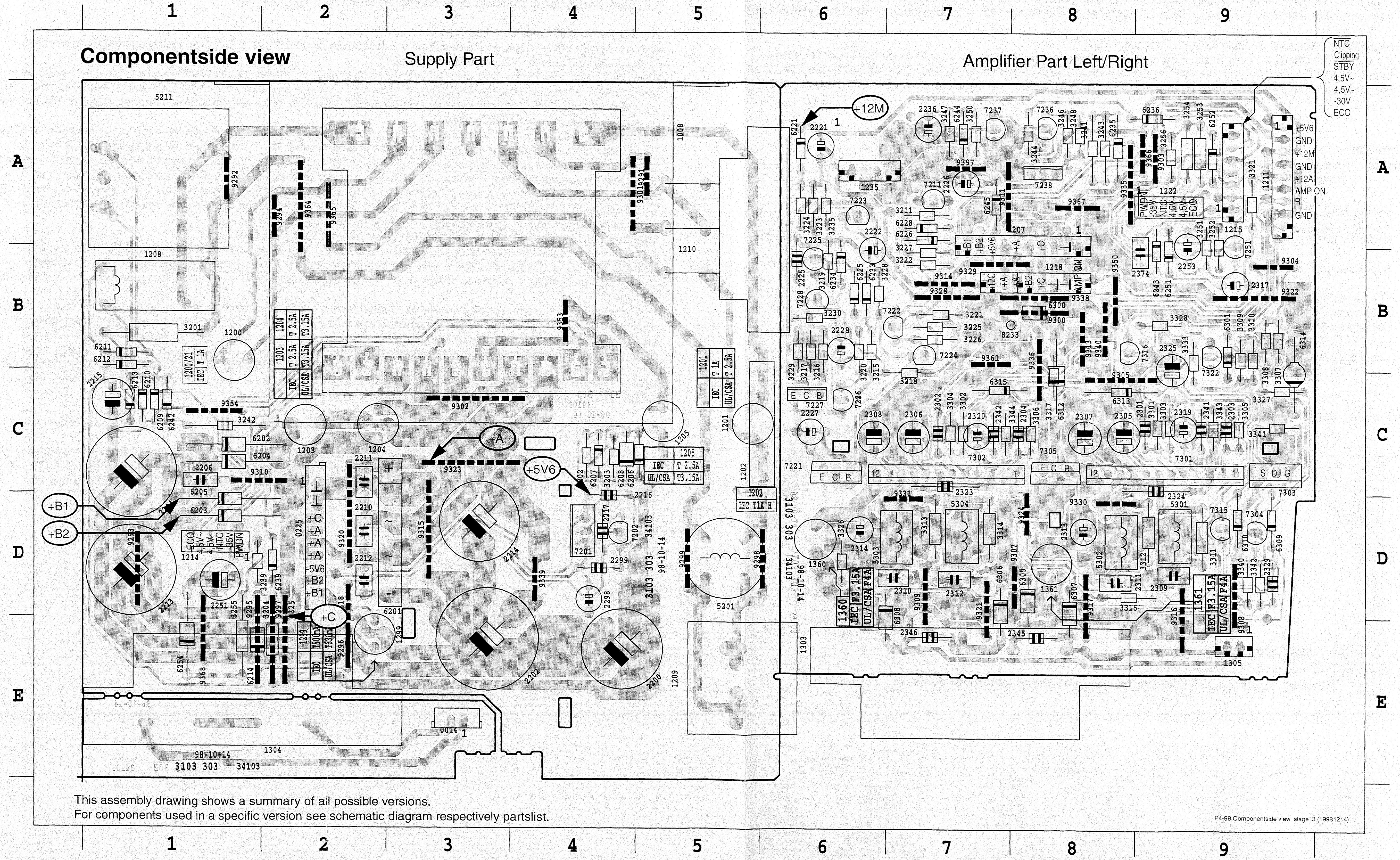
- For Center/Surround-amplifier the function of the Super Class G circuit is similar. Instead of +B1 there +B2 is connected.

- For the /37-versions with two channel-application the so called MATRIX SURROUND is added. The 2 surround-speakers are added in a way, that in case of STEREO a high signal can be measured (up to 10W per speaker at 6 Ohm). In MONO only a few 100mW are available. Result: The widening of the STEREO base is increased without any additional electronic or amplifier.

- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system (e.g. FB206,FB208).

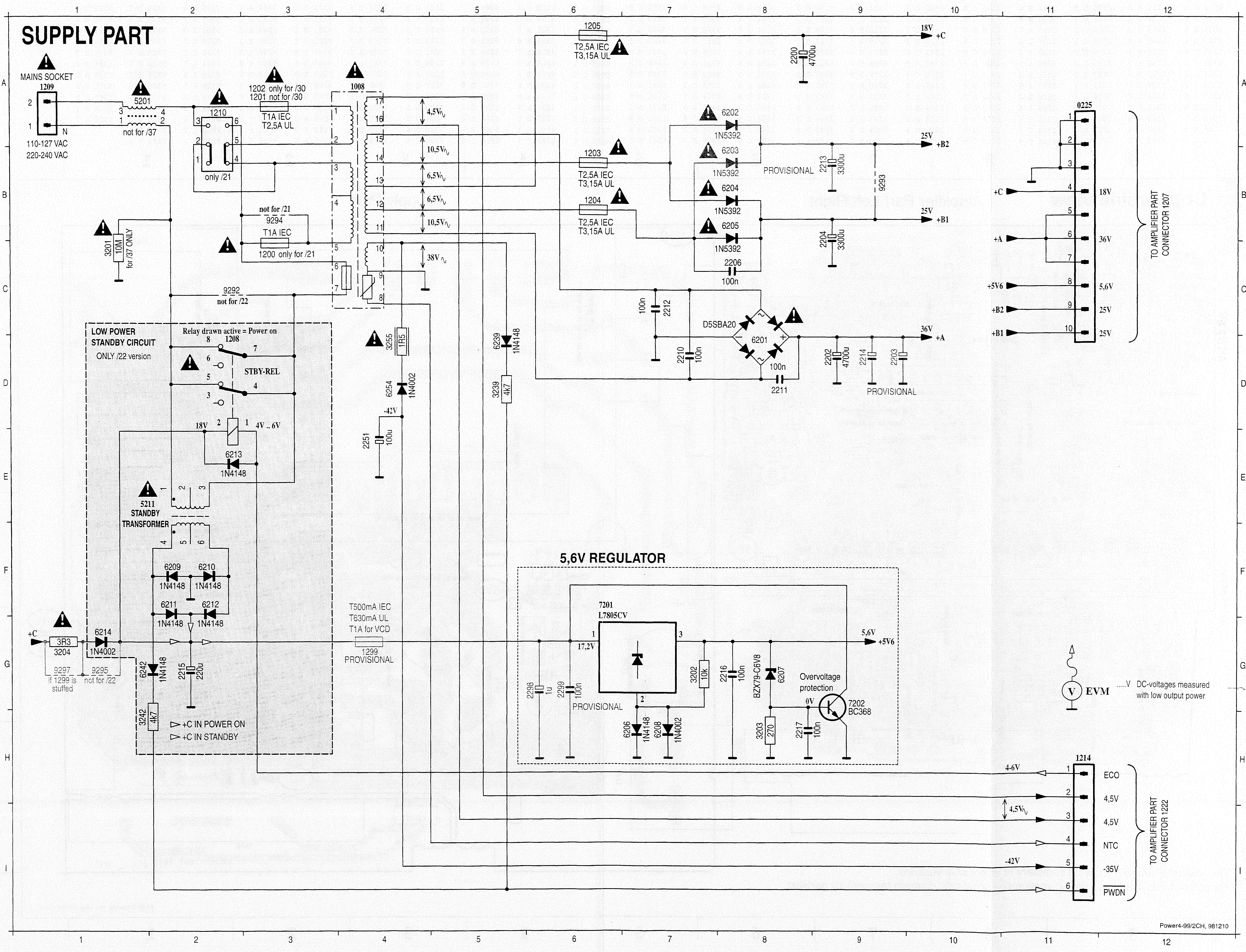
0014 E 3	1211 A 9	2200 E 5	2222 B 6	2304 C 8	2320 C 7	3204 E 2	3226 B 7	3248 A 8	3306 C 8	3327 C 9	5304 D 7	6213 C 1	6244 A 7	6312 C 8	7227 C 6	7322 B 9	9292 A 1	9305 C 8	9321 D 7	9340 B 8
0225 D 2	1214 D 1	2202 E 4	2225 B 6	2305 C 8	2323 C 7	3211 A 7	3227 B 7	3250 A 7	3307 B 9	3328 B 9	6201 D 2	6214 E 1	6245 A 7	6313 C 8	7228 B 6	8233 B 7	9293 D 1	9307 D 8	9322 B 9	9350 B 8
1008 A 3	1215 A 9	2204 C 1	2226 A 7	2306 C 7	2324 C 9	3215 B 6	3228 B 6	3251 A 9	3308 B 9	3333 B 9	6202 C 1	6221 A 6	6251 B 9	6314 C 9	7236 A 8	9281 E 8	9294 A 2	9308 D 9	9323 C 3	9353 B 4
1200 B 1	1218 B 8	2206 C 1	2227 C 6	2307 C 8	2325 B 9	3216 B 6	3229 B 6	3252 B 9	3309 B 9	3340 D 9	6203 D 1	6225 B 6	6252 A 9	6315 C 7	7237 A 7	9282 E 8	9295 E 1	9309 D 7	9324 D 8	9354 C 1
1201 C 5	1219 B 8	2210 D 2	2228 B 6	2308 C 6	2329 D 9	3217 B 6	3230 B 6	3253 A 9	3310 B 9	3341 C 9	6204 C 1	6226 A 7	6254 E 1	7201 D 4	7238 A 8	9283 E 8	9296 E 2	9310 C 1	9325 E 2	9361 B 7
1202 C 5	1222 A 9	2211 C 2	2236 A 7	2309 D 9	2341 C 9	3218 C 7	3235 A 6	3254 A 9	3311 D 9	3342 D 9	6205 D 1	6228 A 7	6300 B 8	7202 D 4	7251 A 9	9284 E 8	9297 E 2	9311 A 7	9328 B 7	9364 A 2
1203 C 2	1235 A 6	2212 D 2	2251 D 1	2310 D 7	2342 C 7	3219 B 6	3239 D 1	3255 E 1	3312 D 9	3343 C 9	6206 C 5	6233 B 6	6301 B 9	7211 A 7	7301 C 9	9285 E 8	9298 D 6	9313 B 8	9329 B 7	9365 A 2
1204 C 2	1299 E 2	2213 D 1	2253 A 9	2311 D 8	2345 E 8	3220 B 6	3241 A 8	3256 A 9	3313 D 7	3344 C 7	6207 C 4	6234 B 6	6305 D 8	7221 C 6	7302 C 7	9286 E 9	9299 D 5	9314 B 7	9330 D 8	9366 A 9
1205 C 5	1303 E 7	2214 D 4	2298 D 4	2312 D 7	2346 E 7	3221 B 7	3242 C 1	3301 C 9	3314 D 7	5201 D 5	6208 C 4	6235 A 8	6306 D 7	7222 B 7	7303 C 9	9287 E 9	9300 B 8	9315 D 3	9331 D 7	9367 A 8
1207 B 8	1304 E 1	2215 C 1	2299 D 4	2313 D 8	2374 B 9	3222 B 7	3243 A 8	3302 C 7	3316 D 8	5211 A 1	6209 C 1	6236 A 9	6307 D 8	7223 A 6	7304 D 9	9288 E 9	9301 A 4	9316 E 9	9335 A 8	9368 E 1
1208 B 1	1305 E 9	2216 D 4	2301 C 9	2314 D 6	3201 B 1	3223 A 6	3244 A 8	3303 C 9	3317 C 8	5301 D 9	6210 C 1	6239 D 2	6308 E 6	7224 B 7	7305 C 8	9289 E 9	9302 C 3	9317 D 8	9336 B 8	9397 A 7
1209 E 5	1360 D 6	2217 D 4	2302 C 7	2317 B 9	3202 C 4	3224 A 6	3246 A 8	3304 C 7	3321 A 9	5302 D 8	6211 B 1	6242 C 1	6309 D 9	7225 B 6	7315 D 9	9290 E 9	9303 A 9	9318 E 2	9338 B 8	
1210 A 5	1361 D 8	2221 A 6	2303 C 9	2319 C 9	3203 C 4	3225 B 7	3247 A 7	3305 C 9	3326 D 6	5303 D 7	6212 B 1	6243 B 9	6310 D 9	7226 C 6	7316 B 8	9291 A 5	9304 B 9	9320 D 2	9339 D 4	

Componentside view


Supply Part
Amplifier Part Left/Right
1
2
3
4
5
6
7
8
9
A
B
C
D
E
NTC
Clipping
STBY
4,5V~
4,5V~
-30V
ECO
+5V6
GND
+12M
GND
+12A
AMP ON
R
GND
L
+12M
+A
+5V6
+C
+B1
+B2
ECO
4,5V~
4,5V~
NTC
-35V
PWDN
1205
IEC T 2.5A
UL/CSA T3.15A
1201
IEC T 1A
UL/CSA T 2.5A
1202
IEC T1A H
1203 IEC T 2.5A UL/CSA T3.15A
1204 T 2.5A T3.15A
1200/21 IEC T 1A
1219 IEC T500mA UL/CSA T630mA
1360 IEC F3.15A UL/CSA F4A
1361 IEC F3.15A UL/CSA F4A
E C B
S D G
98-10-14
3103 303 34103
P4-99 Componentside view stage .3 (19981214)

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

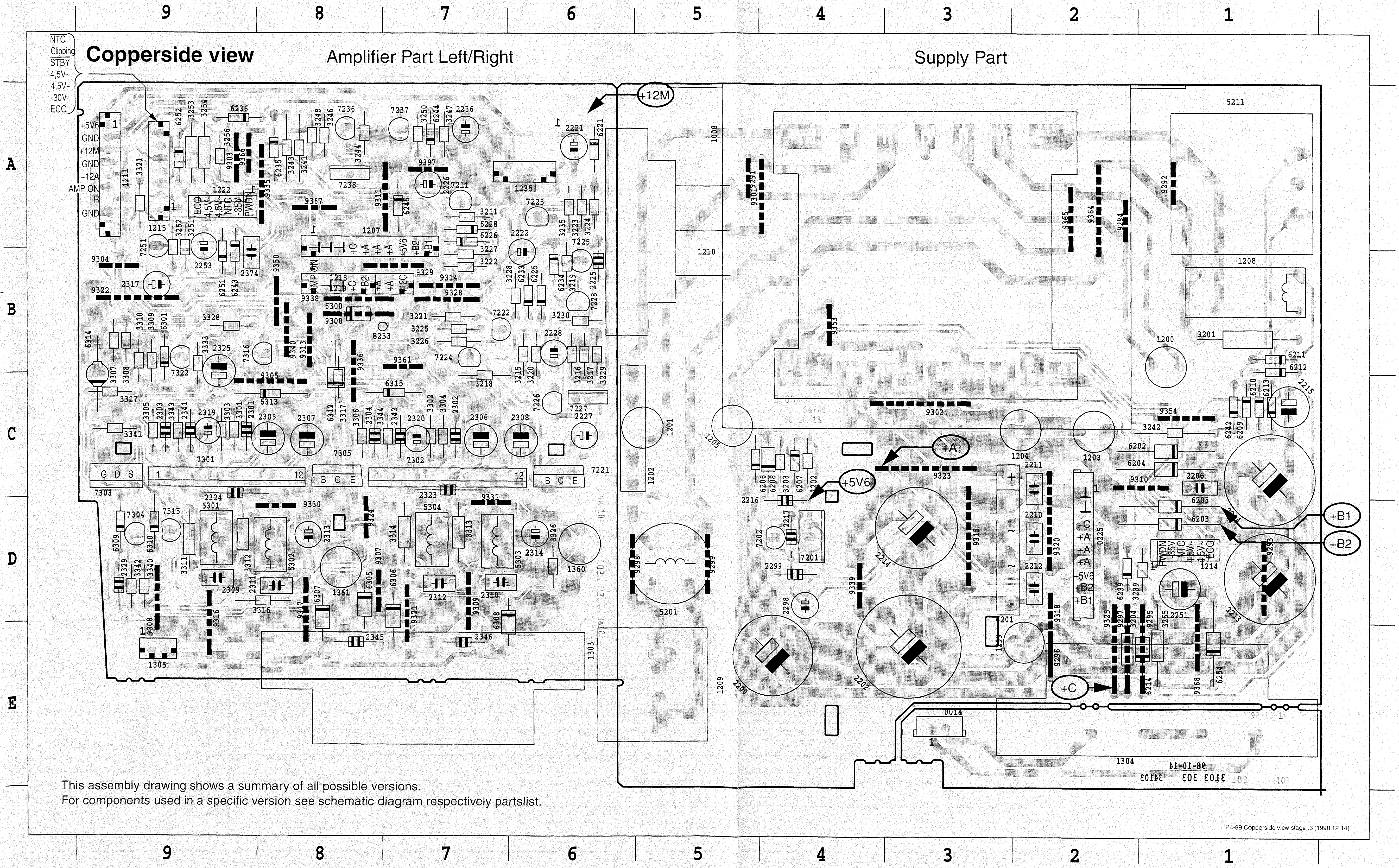
SUPPLY PART


MAINS SOCKET
1209
110-127 VAC
220-240 VAC
N
5201
not for /37
1210
only /21
1202 only for /30
1201 not for /30
T1A IEC
T2,5A UL
1008
not for /21
9294
T1A IEC
1200 only for /21
3201
10M
for /37 ONLY
9292
not for /22
4,5V
10,5V
6,5V
6,5V
10,5V
38V
1205
T2,5A IEC
T3,15A UL
18V
+C
2200
4700u
6202
1N5392
6203
1N5392
6204
1N5392
6205
1N5392
1203
T2,5A IEC
T3,15A UL
1204
T2,5A IEC
T3,15A UL
2206
100n
PROVISIONAL
2213
3300u
9293
25V
+B2
2204
3300u
25V
+B1
2212
100n
D5SBA20
6201
2210
100n
100n
2211
36V
+A
2202
4700u
2214
2203
PROVISIONAL
3255
1R5
6254
1N4002
-42V
2251
100u
6239
1N4148
3239
4K7
LOW POWER
STANDBY CIRCUIT
ONLY /22 version
Relay drawn active = Power on
1208
STBY-REL
18V
4V .. 6V
6213
1N4148
5211
STANDBY
TRANSFORMER
6209
1N4148
6210
1N4148
6211
1N4148
6212
1N4148
3R3
3204
6214
1N4002
9297
if 1299 is stuffed
9295
not for /22
6242
1N4148
2215
220u
3242
4k7
+C IN POWER ON
+C IN STANDBY
T500mA IEC
T630mA UL
T1A for VCD
1299
PROVISIONAL
5,6V REGULATOR
7201
L7805CV
17,2V
5,6V
+5V6
2298
1u
2299
100n
PROVISIONAL
6206
1N4148
6208
1N4002
3202
10k
2216
100n
BZX79-C6V8
6207
Overvoltage protection
0V
7202
BC368
3203
270
2217
100n
0225
18V
36V
5,6V
25V
25V
+C
+A
+5V6
+B2
+B1
TO AMPLIFIER PART CONNECTOR 1207
EVM
.....V DC-voltages measured with low output power
1214
4-6V
4,5V
-42V
ECO
4,5V
4,5V
NTC
-35V
PWDN
TO AMPLIFIER PART CONNECTOR 1222
Power4-99/2CH, 981210

0225	A11
1008	A 4
1200	B 3
1201	A 3
1202	A 3
1203	B 6
1204	B 6
1205	A 6
1208	D 2
1209	B 1
1210	A 2
1214	I11
2200	A 8
2202	D 9
2203	D 9
2204	B 9
2206	C 8
2210	D 7
2211	D 8
2212	C 7
2213	B 9
2214	D 9
2215	G 2
2216	G 7
2217	H 8
2251	E 4
2298	G 5
2299	G 6
3201	C 1
3202	G 7
3203	H 8
3204	G 1
3239	D 5
3242	H 1
3255	D 4
5201	A 1
5211	E 1
6201	C 8
6202	A 8
6203	A 8
6204	B 8
6205	B 8
6206	H 6
6207	G 8
6208	H 7
6209	F 2
6210	F 2
6211	F 2
6212	F 2
6213	E 2
6214	G 1
6239	D 5
6242	G 1
6254	D 4
7201	F 6
7202	G 9
9292	C 2
9293	B 9
9294	B 3
9295	F 4

CS 53 216

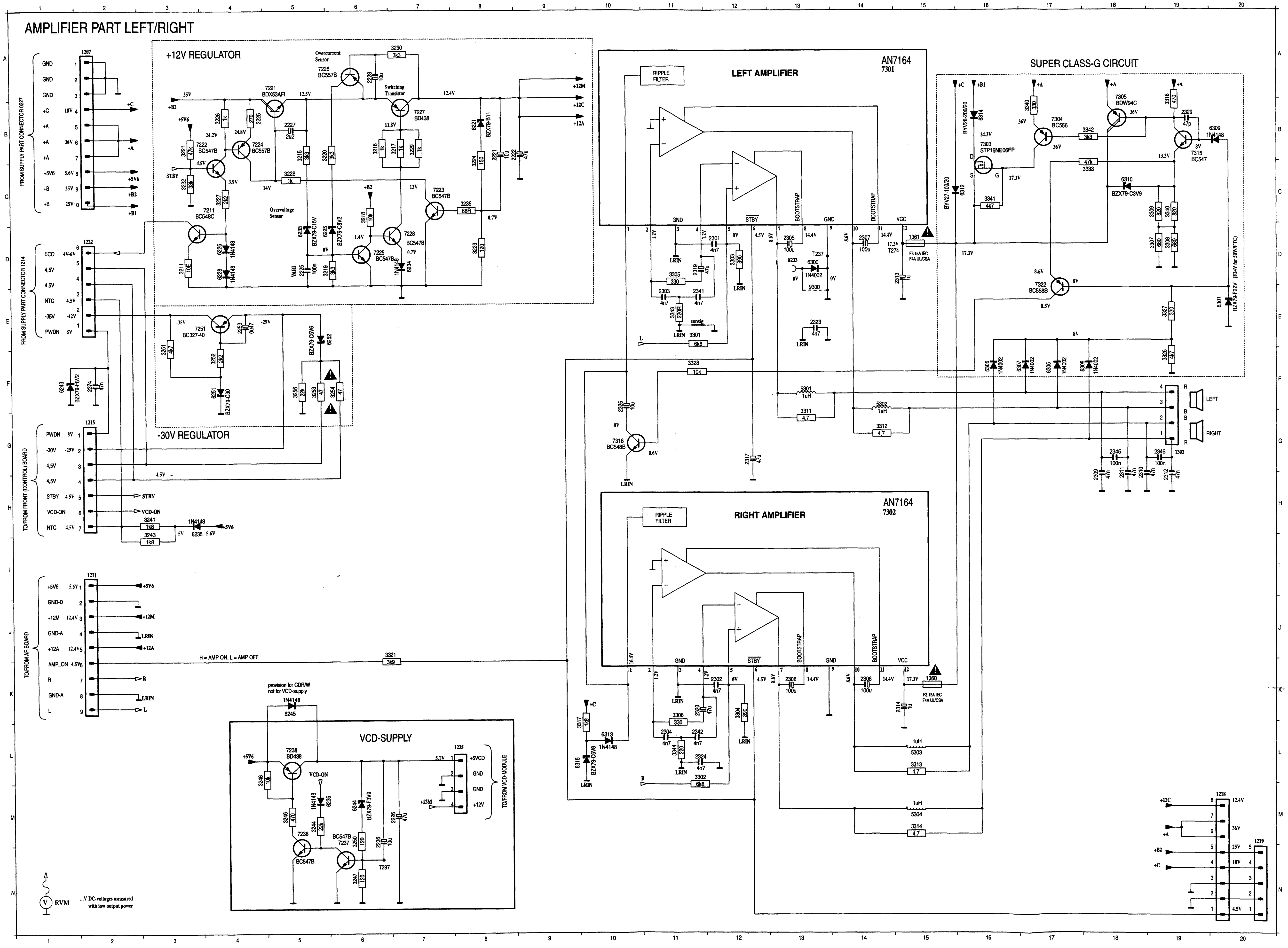
0014 E 3	1211 A 9	2200 E 5	2222 B 6	2304 C 8	2320 C 7	3204 E 2	3226 B 7	3248 A 8	3306 C 8	3327 C 9	5304 D 7	6213 C 1	6244 A 7	6312 C 8	7227 C 6	7322 B 9	9292 A 1	9305 C 8	9321 D 7	9340 B 8
0225 D 2	1214 D 1	2202 E 4	2225 B 6	2305 C 8	2323 C 7	3211 A 7	3227 B 7	3250 A 7	3307 B 9	3328 B 9	6201 D 2	6214 E 1	6245 A 7	6313 C 8	7228 B 6	8233 B 7	9293 D 1	9307 D 8	9322 B 9	9350 B 8
1008 A 3	1215 A 9	2204 C 1	2226 A 7	2306 C 7	2324 C 9	3215 B 6	3228 B 6	3251 A 9	3308 B 9	3333 B 9	6202 C 1	6221 A 6	6251 B 9	6314 C 9	7236 A 8	9281 E 8	9294 A 2	9308 D 9	9323 C 3	9353 B 4
1200 B 1	1218 B 8	2206 C 1	2227 C 6	2307 C 8	2325 B 9	3216 B 6	3229 B 6	3252 B 9	3309 B 9	3340 D 9	6203 D 1	6225 B 6	6252 A 9	6315 C 7	7237 A 7	9282 E 8	9295 E 1	9309 D 7	9324 D 8	9354 C 1
1201 C 5	1219 B 8	2210 D 2	2228 B 6	2308 C 6	2329 D 9	3217 B 6	3230 B 6	3253 A 9	3310 B 9	3341 C 9	6204 C 1	6226 A 7	6254 E 1	7201 D 4	7238 A 8	9283 E 8	9296 E 2	9310 C 1	9325 E 2	9361 B 7
1202 C 5	1222 A 9	2211 C 2	2236 A 7	2309 D 9	2341 C 9	3218 C 7	3235 A 6	3254 A 9	3311 D 9	3342 D 9	6205 D 1	6228 A 7	6300 B 8	7202 D 4	7251 A 9	9284 E 8	9297 E 2	9311 A 7	9328 B 7	9364 A 2
1203 C 2	1235 A 6	2212 D 2	2251 D 1	2310 D 7	2342 C 7	3219 B 6	3239 D 1	3255 E 1	3312 D 9	3343 C 9	6206 C 5	6233 B 6	6301 B 9	7211 A 7	7301 C 9	9285 E 8	9298 D 6	9313 B 8	9329 B 7	9365 A 2
1204 C 2	1299 E 2	2213 D 1	2253 A 9	2311 D 8	2345 E 8	3220 B 6	3241 A 8	3256 A 9	3313 D 7	3344 C 7	6207 C 4	6234 B 6	6305 D 8	7221 C 6	7302 C 7	9286 E 9	9299 D 5	9314 B 7	9330 D 8	9366 A 9
1205 C 5	1303 E 7	2214 D 4	2298 D 4	2312 D 7	2346 E 7	3221 B 7	3242 C 1	3301 C 9	3314 D 7	5201 D 5	6208 C 4	6235 A 8	6306 D 7	7222 B 7	7303 C 9	9287 E 9	9300 B 8	9315 D 3	9331 D 7	9367 A 8
1207 B 8	1304 E 1	2215 C 1	2299 D 4	2313 D 8	2374 B 9	3222 B 7	3243 A 8	3302 C 7	3316 D 8	5211 A 1	6209 C 1	6236 A 9	6307 D 8	7223 A 6	7304 D 9	9288 E 9	9301 A 4	9316 E 9	9335 A 8	9368 E 1
1208 B 1	1305 E 9	2216 D 4	2301 C 9	2314 D 6	3201 B 1	3223 A 6	3244 A 8	3303 C 9	3317 C 8	5301 D 9	6210 C 1	6239 D 2	6308 E 6	7224 B 7	7305 C 8	9289 E 9	9302 C 3	9317 D 8	9336 B 8	9397 A 7
1209 E 5	1360 D 6	2217 D 4	2302 C 7	2317 B 9	3202 C 4	3224 A 6	3246 A 8	3304 C 7	3321 A 9	5302 D 8	6211 B 1	6242 C 1	6309 D 9	7225 B 6	7315 D 9	9290 E 9	9303 A 9	9318 E 2	9338 B 8	
1210 A 5	1361 D 8	2221 A 6	2303 C 9	2319 C 9	3203 C 4	3225 B 7	3247 A 7	3305 C 9	3326 D 6	5303 D 7	6212 B 1	6243 B 9	6310 D 9	7226 C 6	7316 B 8	9291 A 5	9304 B 9	9320 D 2	9339 D 4	



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

P4-99 Copperside view stage .3 (1998 12 14)

AMPLIFIER PART LEFT/RIGHT

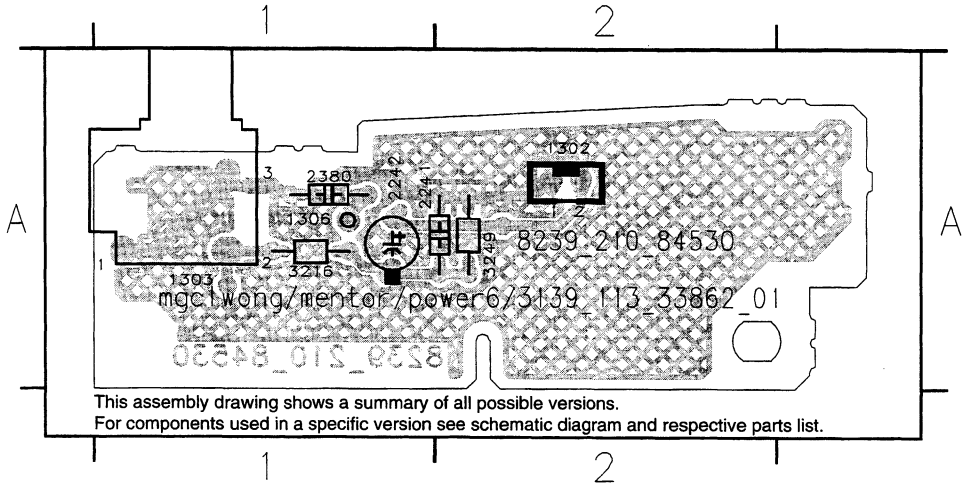

+12V REGULATOR
-30V REGULATOR
LEFT AMPLIFIER
AN7164
7301
RIGHT AMPLIFIER
AN7164
7302
RIPPLE FILTER
SUPER CLASS-G CIRCUIT
VCD-SUPPLY
FROM SUPPLY PART CONNECTOR 0227
FROM SUPPLY PART CONNECTOR 1214
TO/FROM FRONT (CONTROL) BOARD
TO/FROM AF-BOARD
TO/FROM VCD-MODULE
Overcurrent Sensor
Switching Transistor
Overvoltage Sensor
H = AMP ON, L = AMP OFF
provision for CDR/W not for VCD-supply
LEFT
RIGHT
GND
STBY
BOOTSTRAP
VCC
F3.15A IEC F4A UL/CSA
...V DC-voltages measured with low output power
EVM

0014	I17
1207	A 2
1211	I 2
1215	G 2
1218	M20
1219	M20
1222	D 2
1235	L 7
1303	G19
1304	I19
1305	I17
1360	K15
1361	D15
2221	B 8
2222	B 9
2225	D 5
2226	M 7
2227	B 5
2228	A 6
2236	M 6
2253	E 4
2301	D12
2302	K12
2303	E11
2304	L11
2305	D13
2306	K13
2307	D14
2308	K14
2309	H18
2310	H18
2311	H18
2312	H19
2313	D15
2314	K15
2317	G12
2319	D11
2320	K11
2323	E13
2324	L11
2325	F10
2329	B19
2341	E11
2342	L11
2345	G18
2346	G19
2374	F 2
3211	D 3
3215	B 5
3216	B 6
3217	B 7
3218	C 6
3219	D 6
3220	B 6
3221	B 3
3222	C 3
3223	D 8
3224	B 8
3225	B 4
3226	B 4
3227	C 4
3228	C 5
3229	B 7
3230	A 7
3235	C 8
3241	H 3
3243	H 3
3244	M 5
3246	M 5
3247	N 6
3248	L 4
3250	M 6
3251	E 3
3252	F 4
3253	F 5
3254	F 6
3256	F 5
3301	E11
3302	L11
3303	D12
3304	K12
3305	D11
3306	K11
3307	D19
3308	D19
3309	C19
3310	C19
3311	G13
3312	G14
3313	L15
3314	M15
3316	B19
3317	L10
3321	J 6
3326	F19
3327	E19
3328	F11
3333	C18
3340	B17
3341	C16
3342	B18
3343	E11
3344	L11
5301	F13
5302	F14
5303	L15
5304	M15
6221	B 8
6225	D 6
6226	D 4
6228	D 4
6233	D 5
6234	D 7
6235	H 3
6236	M 5
6243	F 1
6244	M 6
6245	K 5
6251	F 4
6252	E 5
6300	D13
6301	E20
6305	F17
6306	F16
6307	F17
6308	F18
6309	B20
6310	C18
6312	C16
6313	L10
6314	B16
6315	L 9
7211	C 4
7221	A 5
7222	B 3
7223	C 7
7224	B 4
7225	D 6
7226	A 5
7227	B 7
7228	D 7
7236	M 5
7237	M 6
7238	L 5
7251	E 3
7301	A15
7302	H15
7303	B16
7304	B17
7305	B18
7315	B19
7316	G10
7322	E17
8233	D13
9281	K17
9282	K17
9283	L17
9284	L17
9285	L17
9286	L17
9287	M17
9288	M17
9289	M17
9290	N17
9300	E13

CS 53 218

SURROUND CINCH-OUT PART- COMPONENT VIEW

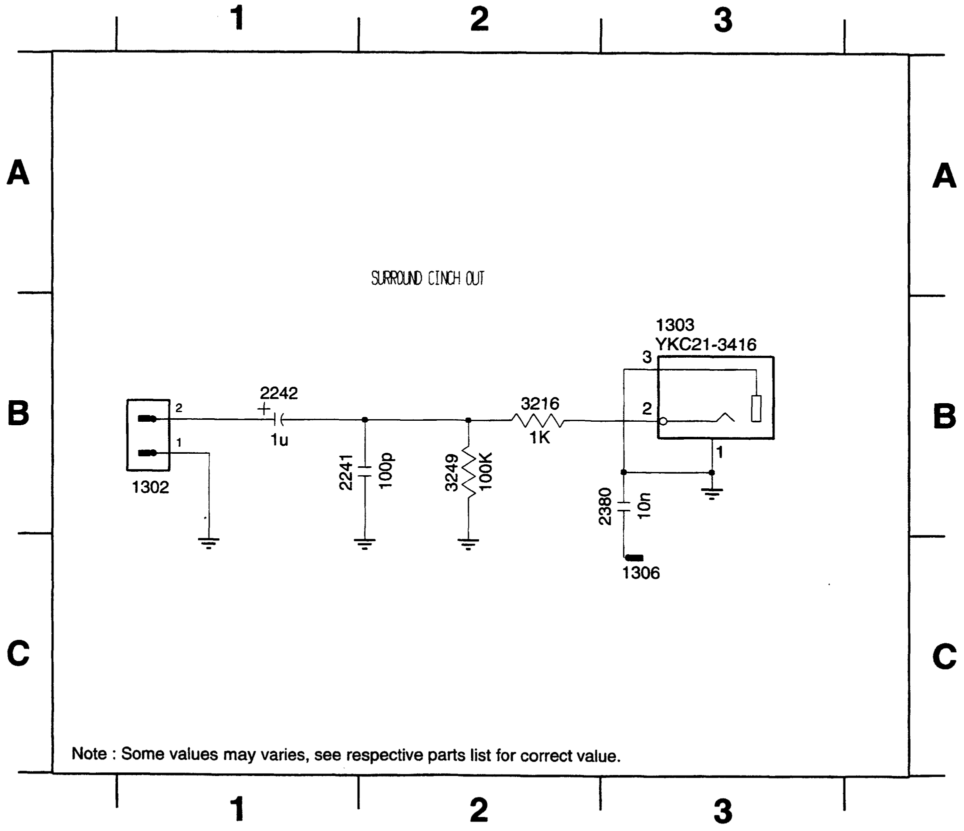
1302	A2	1306	A1	2242	A1	3216	A1
1303	A1	2241	A1	2380	A1	3249	A2


1
2
A
1302
2380
1306
2242
2241
3249
3216
1303
8239 210 84530
mgclwong/mentor/power6/3139 113 33862_01

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

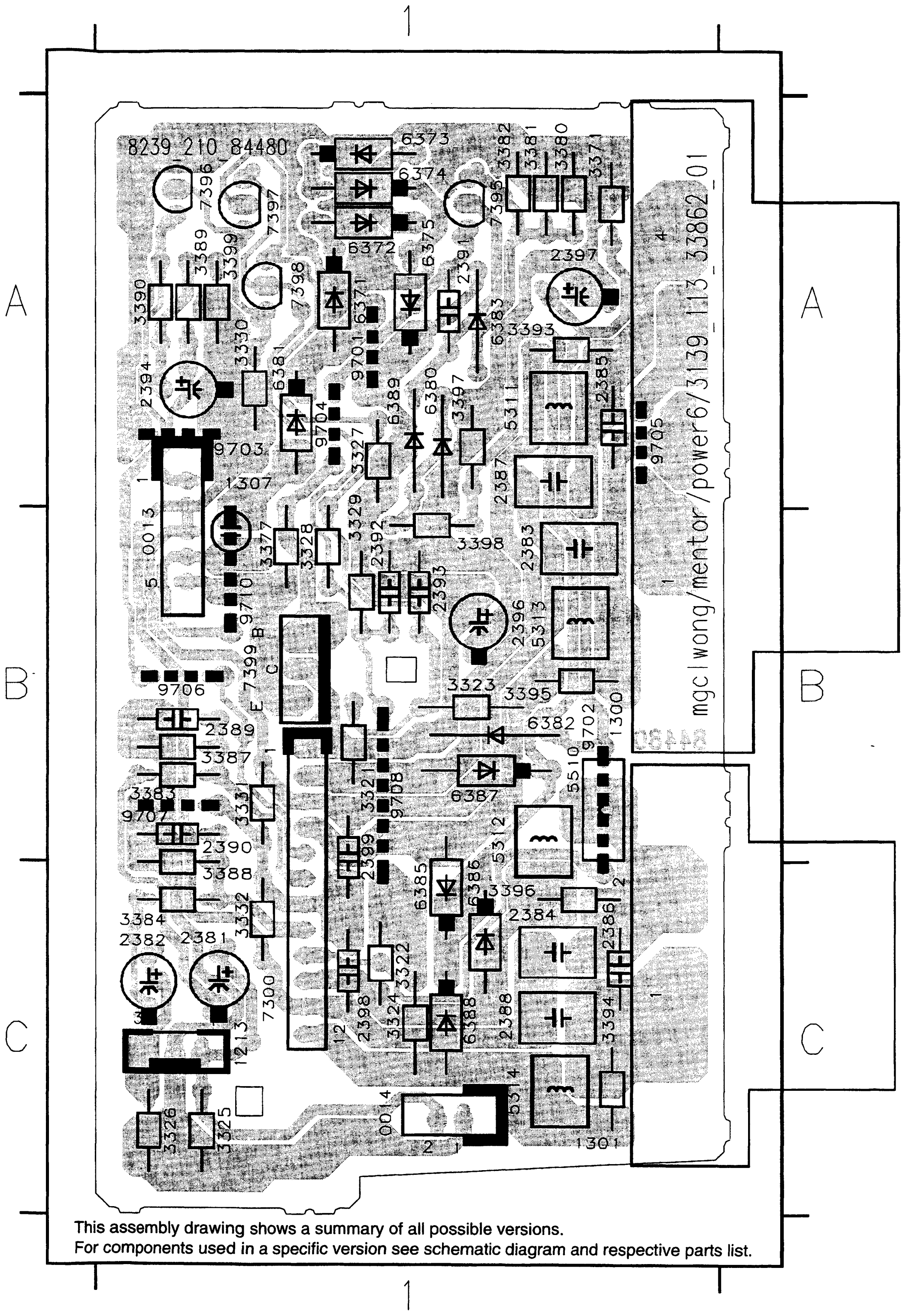
SURROUND CINCH-OUT PART - CIRCUIT DIAGRAM

1302	**B1**	**1303**	**B3**	**1306**	**C3**	**2241**	**B1**	**2242**	**B1**	**2380**	**B3**	**3216**	**B2**	**3249**	**B2**


1
2
3
A
B
C
SURROUND CINCH OUT
1302
2242
1u
2241
100p
3249
100K
3216
1K
2380
10n
1306
1303
YKC21-3416

Note : Some values may varies, see respective parts list for correct value.

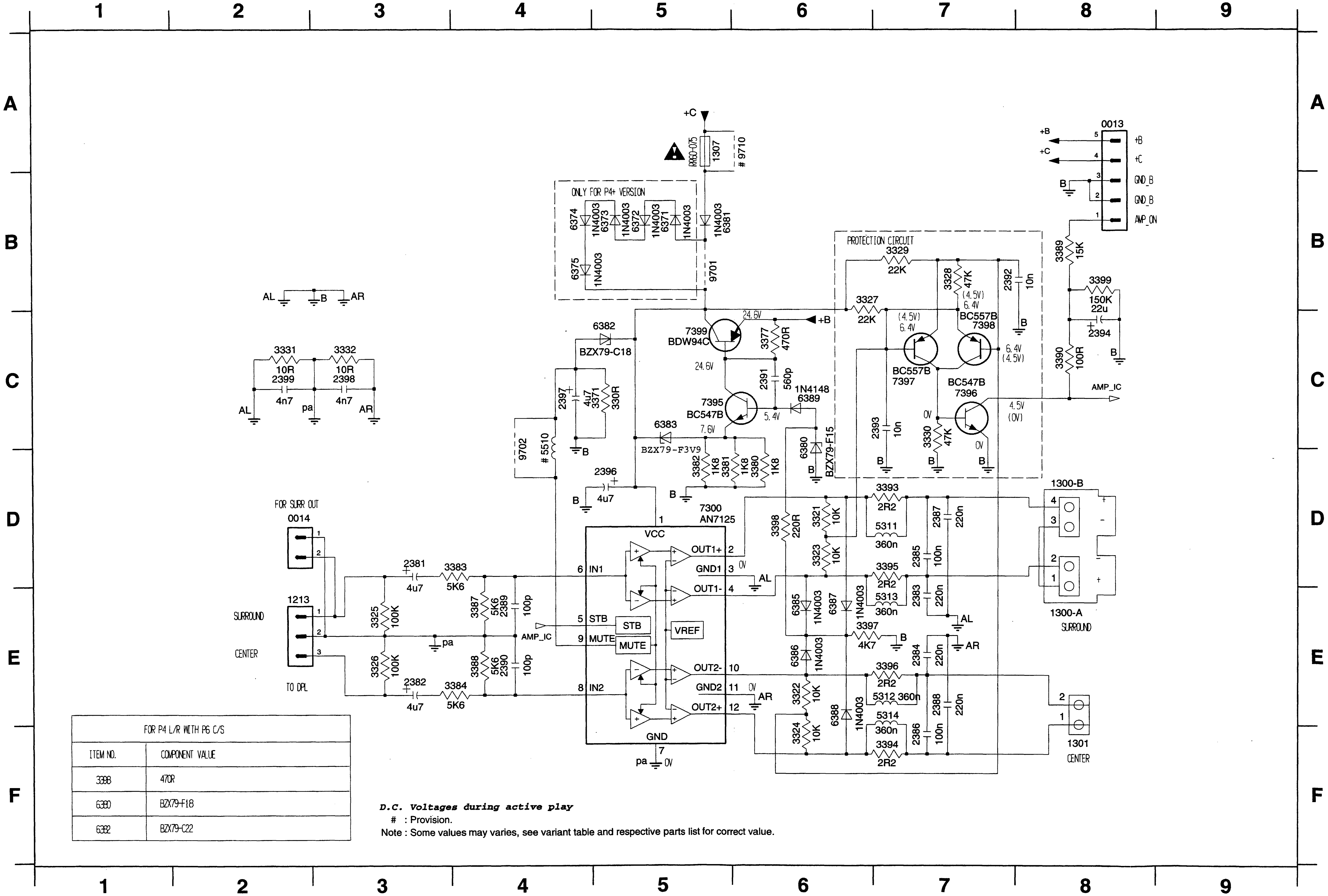
AMPLIFIER PART CENTER/SURROUND - COMPONENT VIEW


1
A
B
C
8239 210 84480
mgclwong/mentor/power6/3139 113 33862_01
7300
7399
1307
0013
0014
1300
1301

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

0013	B1
0014	C1
1213	C1
1300	B1
1301	C1
1307	A1
2381	C1
2382	C1
2383	B1
2384	C1
2385	A1
2386	C1
2387	A1
2388	C1
2389	B1
2390	B1
2391	A1
2392	B1
2393	B1
2394	A1
2396	B1
2397	A1
2398	C1
2399	B1
3321	B1
3322	C1
3323	B1
3324	C1
3325	C1
3326	C1
3327	A1
3328	B1
3329	B1
3330	A1
3331	B1
3332	C1
3371	A1
3377	B1
3380	A1
3381	A1
3382	A1
3383	B1
3384	C1
3387	B1
3388	C1
3389	A1
3390	A1
3393	A1
3394	C1
3395	B1
3396	C1
3397	A1
3398	B1
3399	A1
5311	A1
5312	B1
5313	B1
5314	C1
5510	B1
6371	A1
6372	A1
6373	A1
6374	A1
6375	A1
6380	A1
6381	A1
6382	B1
6383	A1
6385	C1
6386	C1
6387	B1
6388	C1
6389	A1
7300	C1
7395	A1
7396	A1
7397	A1
7398	A1
7399	B1
9701	A1
9702	B1
9703	A1
9704	A1
9705	A1
9706	B1
9707	B1
9708	B1
9710	B1

AMPLIFIER PART CENTER/SURROUND - CIRCUIT DIAGRAM


1 2 3 4 5 6 7 8 9
A B C D E F
+C
1307
RKCO-075
# 9710
ONLY FOR P4+ VERSION
6374 6373 6372 6371 6381 6375
1N4003
9701
PROTECTION CIRCUIT
3329 22K
3327 22K
3328 47K
2392 10n
BC557B 7398
BC557B 7397
BC547B 7396
3330 47K
2393 10n
(4.5V) 6.4V
0V
(0V)
4.5V
AMP_IC
0013
+B
+C
GND_B
AMP_ON
3389 15K
3399 150K
22u 2394
3390 100R
AL B AR
3331 10R
3332 10R
2399 4n7
2398 4n7
pa
6382 BZX79-C18
7399 BDW94C
24.6V
3377 470R
2391 560p
1N4148 6389
7395 BC547B
5.4V
7.6V
6383 BZX79-F3V9
3382 1K8
3381 1K8
3380 1K8
6380 BZX79-F15
2397 4u7
3371 330R
9702
# 5510
2396 4u7
FOR SURR OUT
0014
1213
SURROUND
CENTER
TO DPL
2381 4u7
3383 5K6
3325 100K
3326 100K
3387 5K6
2389 100p
3388 5K6
2390 100p
2382 4u7
3384 5K6
7300 AN7125
VCC
IN1
IN2
STB
MUTE
VREF
OUT1+
GND1
OUT1-
OUT2-
GND2
OUT2+
GND
3398 220R
3321 10K
3323 10K
3322 10K
3324 10K
6385 6386 6387 6388
3393 2R2
5311 360n
2387 220n
2385 100n
3395 2R2
5313 360n
2383 220n
3397 4K7
2384 220n
3396 2R2
5312 360n
2388 220n
5314 360n
2386 100n
3394 2R2
1300-B
1300-A
SURROUND
1301
CENTER
AL
AR

FOR P4 L/R WITH P6 C/S	
ITEM NO.	COMPONENT VALUE
3398	470R
6380	BZX79-F18
6382	BZX79-C22

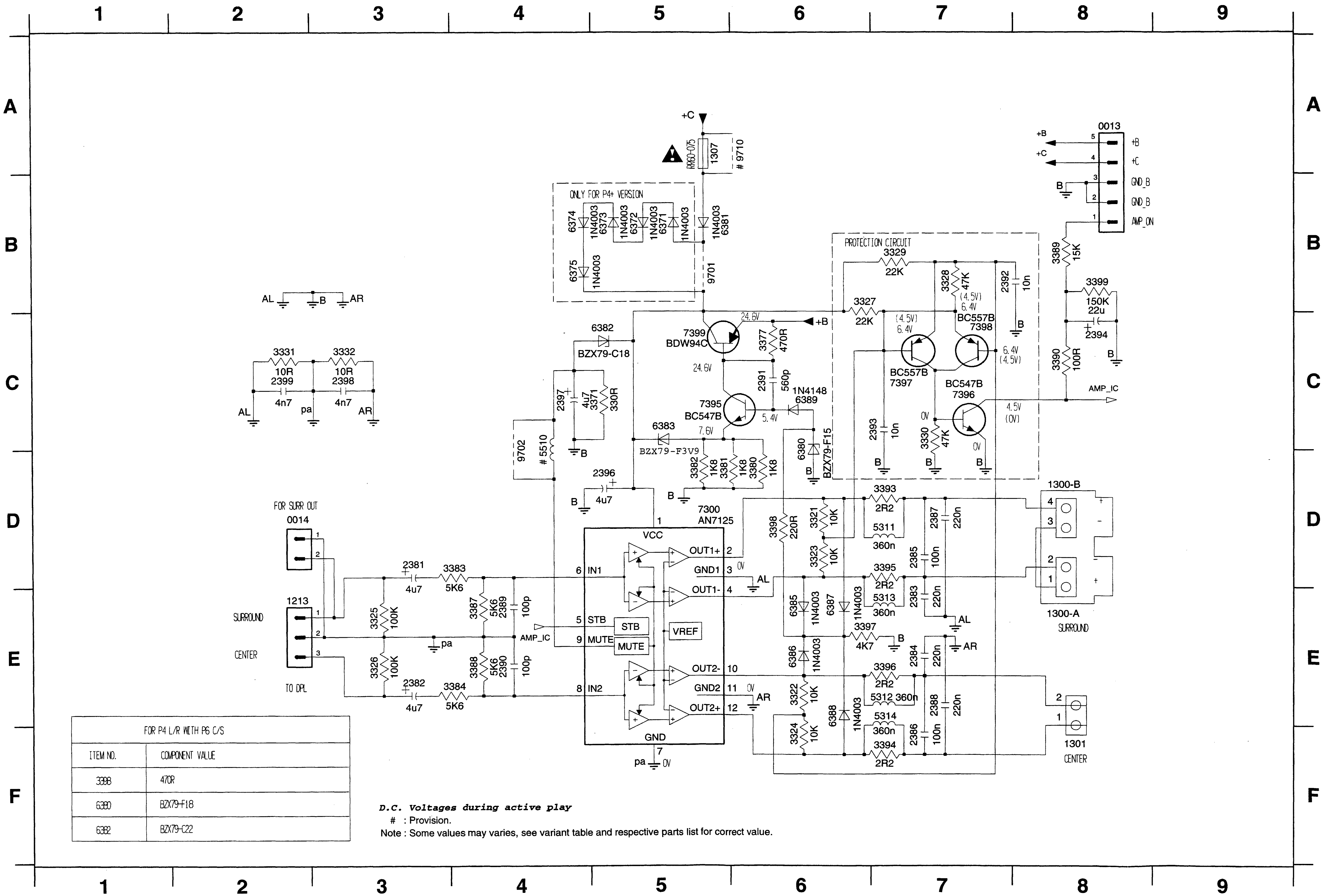
D.C. Voltages during active play

# : Provision.

Note : Some values may varies, see variant table and respective parts list for correct value.

0013	A8
0014	D2
1213	E2
1300-A	E8
1300-B	D8
1301	F8
1307	A5
2381	D3
2382	E3
2383	E7
2384	E7
2385	D7
2386	F7
2387	D7
2388	E7
2389	E4
2390	E4
2391	C6
2392	B7
2393	C7
2394	C8
2396	D5
2397	C4
2398	C3
2399	C2
3321	D6
3322	E6
3323	D6
3324	F6
3325	E3
3326	E3
3327	B6
3328	B7
3329	B7
3330	C7
3331	C2
3332	C3
3371	C5
3377	C6
3380	D6
3381	D5
3382	D5
3383	D4
3384	E4
3387	E4
3388	E4
3389	B8
3390	C8
3393	D7
3394	F7
3395	D7
3396	E7
3397	E6
3398	D6
3399	B8
5311	D7
5312	E7
5313	E7
5314	E7
5510	C4
6371	B5
6372	B5
6373	B5
6374	B4
6375	B4
6380	C6
6381	B5
6382	C5
6383	C5
6385	E6
6386	E6
6387	E6
6388	E6
6389	C6
7300	D5
7395	C5
7396	C7
7397	C7
7398	C7
7399	C5
9701	B5
9702	D4
9710	A5

AMPLIFIER PART CENTER/SURROUND - CIRCUIT DIAGRAM


1 2 3 4 5 6 7 8 9
A B C D E F
+C
RXE0-075
1307
# 9710
ONLY FOR P4+ VERSION
6374 1N4003
6373 1N4003
6372 1N4003
6371 1N4003
6375 1N4003
6381 1N4003
9701
AL B AR
3331 10R
3332 10R
2399 4n7
2398 4n7
pa
6382 BZX79-C18
2397 4u7
3371 330R
9702
# 5510
7399 BDW94C
24.6V
+B
3377 470R
2391 560p
1N4148 6389
7395 BC547B
5.4V
7.6V
6383 BZX79-F3V9
3382 1K8
3381 1K8
3380 1K8
6380 BZX79-F15
2396 4u7
PROTECTION CIRCUIT
3329 22K
3327 22K
3328 47K
(4.5V) 6.4V
BC557B 7398
BC557B 7397
BC547B 7396
2392 10n
2393 10n
3330 47K
0V
4.5V (0V)
0013
+B +C GND_B GND_B AMP_ON
3389 15K
3399 150K
22u 2394
3390 100R
AMP_IC
FOR SURR OUT
0014
1213
SURROUND
CENTER
TO DPL
2381 4u7
3383 5K6
3325 100K
3326 100K
3387 5K6
2389 100p
3388 5K6
2390 100p
2382 4u7
3384 5K6
7300 AN7125
VCC
IN1 STB MUTE IN2
STB MUTE VREF
OUT1+ GND1 OUT1- OUT2- GND2 OUT2+
GND
3398 220R
3321 10K
3323 10K
3322 10K
3324 10K
6385 1N4003
6386 1N4003
6387 1N4003
6388 1N4003
3393 2R2
5311 360n
3395 2R2
5313 360n
3397 4K7
3396 2R2
5312 360n
5314 360n
3394 2R2
2387 220n
2385 100n
2383 220n
2384 220n
2388 220n
2386 100n
1300-B
1300-A
SURROUND
1301
CENTER

FOR P4 L/R WITH P6 C/S	
ITEM NO.	COMPONENT VALUE
3398	470R
6380	BZX79-F18
6382	BZX79-C22

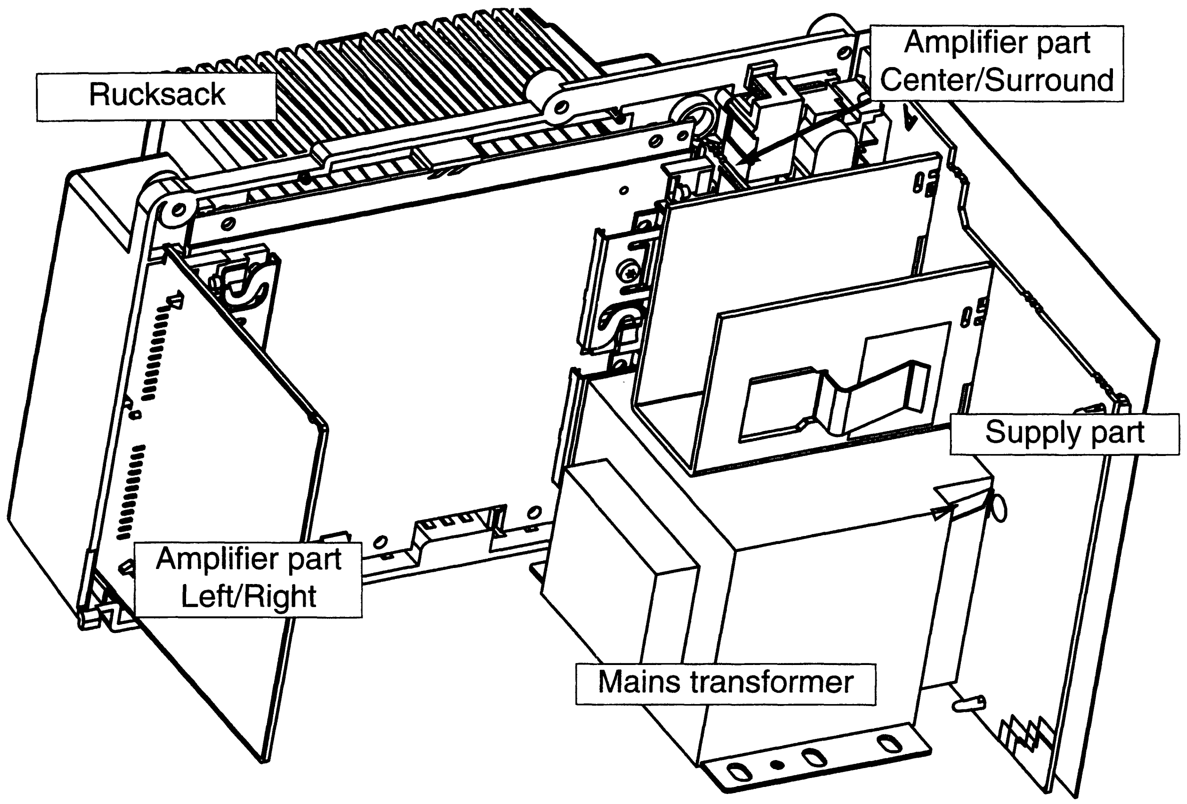
D.C. Voltages during active play

# : Provision.

Note : Some values may varies, see variant table and respective parts list for correct value.

0013	A8
0014	D2
1213	E2
1300-A	E8
1300-B	D8
1301	F8
1307	A5
2381	D3
2382	E3
2383	E7
2384	E7
2385	D7
2386	F7
2387	D7
2388	E7
2389	E4
2390	E4
2391	C6
2392	B7
2393	C7
2394	C8
2396	D5
2397	C4
2398	C3
2399	C2
3321	D6
3322	E6
3323	D6
3324	F6
3325	E3
3326	E3
3327	B6
3328	B7
3329	B7
3330	C7
3331	C2
3332	C3
3371	C5
3377	C6
3380	D6
3381	D5
3382	D5
3383	D4
3384	E4
3387	E4
3388	E4
3389	B8
3390	C8
3393	D7
3394	F7
3395	D7
3396	E7
3397	E6
3398	D6
3399	B8
5311	D7
5312	E7
5313	E7
5314	E7
5510	C4
6371	B5
6372	B5
6373	B5
6374	B4
6375	B4
6380	C6
6381	B5
6382	C5
6383	C5
6385	E6
6386	E6
6387	E6
6388	E6
6389	C6
7300	D5
7395	C5
7396	C7
7397	C7
7398	C7
7399	C5
9701	B5
9702	D4
9710	A5

PARTSLIST POWER4 MODULE



MECHANICAL PARTSLIST POWER4 MODULE

4822 256 10547	RUCKSACK
4822 492 11735	SPRING TRANSISTOR
4822 492 11068	CLIP RECTIFIER
4822 255 40179	SPRING CLIP TO220

ELECTRICAL PARTSLIST POWER4 MODULE

MISCELLANEOUS

1200	4822 071 51002	FUSE T1A
1201	4822 071 51002	FUSE T1A
1201	4822 253 50137	FUSE T 2,5A UL
1202	4822 252 11224	FUSE T1A
1203	4822 071 52502	FUSE T 2,5A
1203	4822 252 51121	FUSE T3,15A UL
1204	4822 071 52502	FUSE T 2,5A
1204	4822 252 51121	FUSE T3,15A UL
1205	4822 071 52502	FUSE T 2,5A
1205	4822 252 51121	FUSE T3,15A UL
1209	4822 265 31015	MAINS SOCKET, IEC
1209	4822 265 31016	MAINS SOCKET
1210	4822 272 10269	VOLTAGE SELECTOR
1303	4822 267 31176	SPEAKER TERMINAL
1360	4822 252 11225	FUSE F3.15A IEC 250V
1360	4822 252 11226	FUSE F4A UL/CSA 250V
1361	4822 252 11225	FUSE F3.15A IEC 250V
1361	4822 252 11226	FUSE F4A UL/CSA 250V

CAPACITORS

2200	4822 124 80103	4700µF	20%	25V
2202	4822 124 80415	4700µF	20%	50V
2204	4822 124 42367	3300µF	20%	35V
2206	5322 121 42386	100nF	5%	63V
2210	5322 121 42386	100nF	5%	63V
2211	5322 121 42386	100nF	5%	63V
2212	5322 121 42386	100nF	5%	63V
2216	4822 126 12882	100nF	20%	50V
2217	4822 126 12882	100nF	20%	50V
2221	4822 124 41579	10µF	20%	50V

CAPACITORS

2222	4822 124 40433	47µF	20%	25V
2227	4822 124 41576	2,2µF	20%	50V
2228	4822 124 41579	10µF	20%	50V
2251	4822 124 40255	100µF	20%	50V
2253	4822 124 41407	0,47µF	20%	63V
2301	4822 126 11714	4,7nF	20%	16V
2302	4822 126 11714	4,7nF	20%	16V
2303	4822 126 11714	4,7nF	20%	16V
2304	4822 126 11714	4,7nF	20%	16V
2305	4822 124 81029	100µF	20%	25V
2306	4822 124 81029	100µF	20%	25V
2307	4822 124 81029	100µF	20%	25V
2308	4822 124 81029	100µF	20%	25V
2309	4822 121 43526	47nF	5%	100V
2310	4822 121 43526	47nF	5%	100V
2311	4822 121 43526	47nF	5%	100V
2312	4822 121 43526	47nF	5%	100V
2313	4822 124 40242	1µF	20%	63V
2314	4822 124 40242	1µF	20%	63V
2317	4822 124 40433	47µF	20%	25V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2323	4822 126 11714	4,7nF	20%	16V
2324	4822 126 11714	4,7nF	20%	16V
2325	4822 124 41579	10µF	20%	50V
2329	4822 122 33848	47pF	5%	50V
2341	4822 126 11714	4,7nF	20%	16V
2342	4822 126 11714	4,7nF	20%	16V
2345	4822 126 12882	100nF	20%	50V
2346	4822 126 12882	100nF	20%	50V
2374	4822 121 43526	47nF	5%	100V

ELECTRICAL PARTSLIST POWER4 MODULE

RESISTORS

3201	4822 053 21106	10MΩ	5%	0,5W
3202	4822 116 83864	10kΩ	5%	0,5W
3203	4822 116 83876	270Ω	5%	0.16W
3204	4822 052 10338	3,3Ω		NFR25
3215	4822 116 52269	3,3kΩ	5%	0,5W
3216	4822 050 11002	1kΩ	5%	0,2W
3217	4822 050 11002	1kΩ	5%	0,2W
3218	4822 116 83864	10kΩ	5%	0,5W
3219	4822 116 52269	3,3kΩ	5%	0,5W
3220	4822 116 52269	3,3kΩ	5%	0,5W
3221	4822 116 83884	47kΩ	5%	0,16W
3222	4822 116 52271	33kΩ	5%	0,16W
3223	4822 116 52206	120Ω	5%	0,5W
3224	4822 116 83868	150Ω	5%	0,5W
3225	4822 116 83876	270Ω	5%	0.16W
3226	4822 050 11002	1kΩ	5%	0,2W
3227	4822 116 52256	2,2kΩ	5%	0,16W
3228	4822 050 11002	1kΩ	5%	0,2W
3229	4822 050 11002	1kΩ	5%	0,2W
3230	4822 116 52269	3,3kΩ	5%	0,5W
3235	4822 116 52199	68Ω	5%	0,16W
3239	4822 116 52283	4,7kΩ	5%	0,5W
3243	4822 116 52228	680Ω	5%	0,5W
3251	4822 116 52283	4,7kΩ	5%	0,5W
3252	4822 116 52256	2,2kΩ	5%	0,16W
3253	4822 052 10479	47Ω	5%	0,3W
3254	4822 052 10479	47Ω	5%	0,3W
3255	4822 117 12148	1,5Ω	5%	
3256	4822 116 52257	22kΩ	5%	0,5W
3301	4822 116 83961	6,8kΩ	5%	0,16W
3302	4822 116 83961	6,8kΩ	5%	0,16W
3303	4822 116 83881	390Ω	5%	0,5W
3304	4822 116 83881	390Ω	5%	0,5W
3305	4822 116 52219	330Ω	5%	0,5W
3306	4822 116 52219	330Ω	5%	0,5W
3307	4822 116 52228	680Ω	5%	0,5W
3308	4822 116 52228	680Ω	5%	0,5W
3309	4822 116 52231	820Ω	5%	0,5W
3310	4822 116 52231	820Ω	5%	0,5W
3311	4822 050 24708	4,7Ω	1%	0,6W
3312	4822 050 24708	4,7Ω	1%	0,6W
3313	4822 050 24708	4,7Ω	1%	0,6W
3314	4822 050 24708	4,7Ω	1%	0,6W
3316	4822 116 83883	470Ω	5%	0,16W
3317	4822 116 52249	1,8kΩ	5%	0,16W
3321	4822 116 52276	3,9kΩ	5%	0,5W
3326	4822 116 52283	4,7kΩ	5%	0,5W
3327	4822 116 52219	330Ω	5%	0,5W
3328	4822 116 83864	10kΩ	5%	0,5W
3333	4822 116 83884	47kΩ	5%	0,16W
3340	4822 116 52219	330Ω	5%	0,5W
3341	4822 116 52283	4,7kΩ	5%	0,5W
3342	4822 116 52269	3,3kΩ	5%	0,5W
3343	4822 116 83872	220Ω	5%	0,5W
3344	4822 116 83872	220Ω	5%	0,5W

COILS

5201	4822 157 11832	400µH
5301	4822 157 62255	COIL 18,5 TURNS
5302	4822 157 62255	COIL 18,5 TURNS
5303	4822 157 62255	COIL 18,5 TURNS
5304	4822 157 62255	COIL 18,5 TURNS

DIODES

6201	4822 130 82078	D5SBA20
6204	5322 130 80686	1N5392
6205	5322 130 80686	1N5392
6206	4822 130 30621	1N4148
6207	4822 130 34278	BZX79-C6V8
6208	4822 130 31878	1N4003G
6221	4822 130 34488	BZX79-C11
6225	4822 130 34382	BZX79-C8V2
6226	4822 130 30621	1N4148
6228	4822 130 30621	1N4148
6233	4822 130 34281	BZX79-C15
6234	4822 130 30621	1N4148
6235	4822 130 30621	1N4148
6239	4822 130 30621	1N4148
6243	4822 130 34382	BZX79-C8V2
6251	4822 130 34328	BZX79-C30
6252	4822 130 34173	BZX79-B5V6
6254	4822 130 31878	1N4003G
6300	4822 130 31878	1N4003G
6301	4822 130 34398	BZX79-C24
6305	4822 130 31878	1N4003G
6306	4822 130 31878	1N4003G
6307	4822 130 31878	1N4003G
6308	4822 130 31878	1N4003G
6309	4822 130 30621	1N4148
6310	4822 130 31981	BZX79-C3V9
6312	4822 130 31982	BYV27-100
6313	4822 130 30621	1N4148
6314	4822 130 80791	BYV28-200/20
6315	4822 130 34278	BZX79-C6V8

TRANSISTORS

7202	5322 130 44647	BC368
7221	4822 130 10812	BDX53BFI
7222	4822 130 40959	BC547B
7223	4822 130 40959	BC547B
7224	4822 130 41691	BC556B
7225	4822 130 40959	BC547B
7226	4822 130 41691	BC556B
7227	4822 130 40995	BD438
7228	4822 130 40959	BC547B
7251	4822 130 41327	BC327-40
7303	4822 130 11336	STP16NE06FP
7304	4822 130 41691	BC556B
7305	4822 130 10847	BDW94C
7315	4822 130 40959	BC547B
7316	4822 130 40959	BC547B
7322	4822 130 44568	BC557B

INTEGRATED CIRCUITS

7201	4822 209 80817	L7805CV
7301	4822 209 90411	AN7164
7302	4822 209 90411	AN7164

ELECTRICAL PARTSLIST POWER4 MODULE Center/Surround part

MISCELLANEOUS

1300	4822 265 10912	SPEAKER TERMINAL 4P
1301	4822 265 10464	SPEAKER TERMINAL 2P
1307	4822 252 11364	RESETTABLE FUSE

CAPACITORS

2381	4822 124 40246	4,7µF	20%	63V
2382	4822 124 40246	4,7µF	20%	63V
2383	4822 121 42408	220nF	5%	63V
2384	4822 121 42408	220nF	5%	63V
2385	4822 126 12882	100nF	20%	50V
2386	4822 126 12882	100nF	20%	50V
2387	4822 121 42408	220nF	5%	63V
2388	4822 121 42408	220nF	5%	63V
2389	4822 122 33195	100pF	10%	50V
2390	4822 122 33195	100pF	10%	50V
2391	4822 122 10459	560pF	10%	50V
2392	4822 121 51387	10nF	20%	16V
2393	4822 121 51387	10nF	20%	16V
2394	4822 124 81151	22µF	20%	50V
2396	4822 124 40246	4,7µF	20%	63V
2397	4822 124 40246	4,7µF	20%	63V
2398	4822 126 11714	4,7nF	20%	16V
2399	4822 126 11714	4,7nF	20%	16V

RESISTORS

3321	4822 116 83864	10kΩ	5%	0,5W
3322	4822 116 83864	10kΩ	5%	0,5W
3323	4822 116 83864	10kΩ	5%	0,5W
3324	4822 116 83864	10kΩ	5%	0,5W
3325	4822 116 52234	100kΩ	5%	0,5W
3326	4822 116 52234	100kΩ	5%	0,5W
3327	4822 116 52257	22kΩ	5%	0,5W
3328	4822 116 83884	47kΩ	5%	0,16W
3329	4822 116 52257	22kΩ	5%	0,5W
3330	4822 116 83884	47kΩ	5%	0,16W
3331	4822 116 52176	10Ω	5%	0,5W
3332	4822 116 52176	10Ω	5%	0,5W
3371	4822 116 52219	330Ω	5%	0,5W
3377	4822 116 83883	470Ω	5%	0,16W
3380	4822 116 52249	1,8kΩ	5%	0,16W
3381	4822 116 52249	1,8kΩ	5%	0,16W
3382	4822 116 52249	1,8kΩ	5%	0,16W
3383	4822 116 52289	5,6kΩ	5%	0,16W
3384	4822 116 52289	5,6kΩ	5%	0,16W
3387	4822 116 52289	5,6kΩ	5%	0,16W
3388	4822 116 52289	5,6kΩ	5%	0,16W
3389	4822 116 52244	15kΩ	5%	0,5W
3390	4822 116 52175	100Ω	5%	0,5W
3393	4822 116 81154	2,2Ω	5%	0,5W
3394	4822 116 81154	2,2Ω	5%	0,5W
3395	4822 116 81154	2,2Ω	5%	0,5W
3396	4822 116 81154	2,2Ω	5%	0,5W
3397	4822 116 52283	4,7kΩ	5%	0,5W
3398	4822 116 83883	470Ω	5%	0,5W
3398	4822 116 83872	220Ω	5%	0,5W
3399	4822 116 52245	150kΩ	5%	0,16W

COILS

5311	4822 157 11837	0,36µH
5312	4822 157 11837	0,36µH
5313	4822 157 11837	0,36µH
5314	4822 157 11837	0,36µH

DIODES

6371	4822 130 31878	1N4003G
6372	4822 130 31878	1N4003G
6373	4822 130 31878	1N4003G
6374	4822 130 31878	1N4003G
6375	4822 130 31878	1N4003G
6380	4822 130 31024	BZX79-F18
6380	4822 130 34281	BZX79-F15
6381	4822 130 31878	1N4003G
6382	4822 130 31024	BZX79-C18
6382	4822 130 34441	BZX79-C22
6383	4822 130 31981	BZX79-F3V9
6385	4822 130 31878	1N4003G
6386	4822 130 31878	1N4003G
6387	4822 130 31878	1N4003G
6388	4822 130 31878	1N4003G
6389	4822 130 30621	1N4148

TRANSISTORS

7395	4822 130 40959	BC547B
7396	4822 130 40959	BC547B
7397	4822 130 44568	BC557B
7398	4822 130 44568	BC557B
7399	4822 130 10847	BDW94C

INTEGRATED CIRCUITS

7300	4822 209 16224	AN7125

AF6 BOARD

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BRIEF INTRODUCTION OF THE AF6 BOARD

The AF6 Board consists of the following features :

a. SOFAC IC
SOFAC IC TEA6321 (7511) which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I^2C Bus from the microprocessor.

The SOFAC IC caters for 4 input sources, namely tuner, tape, CD and AUX.
It also has a MONO input which is tied to ground via a capacitor. In our application, software will switch the input source to previous source MUTE during STANDBY mode and some other occasions where noise from other input source is undesirable.
Note that the input to the SOFAC IC must be ac coupled to prevent 'plop' noise.
Input networks are included to provide appropriate attenuation for various sources.

b. KARAOKE MIC. MIXING
The AF6 Board has provisions which can be configured to cater for one of the following:
NK : Non-Karaoke.
SK : Simple Karaoke which caters for single mic. mixing with additional mic. amplifier board.
FK : Full Karaoke which caters for double mic. mixing with additional mic. amplifier board.

c. DOLBY PRO LOGIC (DPL) INTERFACE
The AF6 Board has provisions which can be configured to cater for Dolby Pro Logic (DPL).

d. LINE OUT
Line out with cinch socket for connection to external amplifier.

e. SUB-WOOFER OUT
Sub-woofer out with cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND
Incredible surround effect using transistor circuit (7531, 7532, 7533, 7534) to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER
Headphone Amplifier to drive 32 ohm to 1kohm headphone.

h. CD STANDBY CONTROL
CD Standby Control circuit which switches on the supply to CD servo control IC, HF circuit and the laser light pen in CD mode only.

i. ATTENUATION NETWORK
Attenuation network is provided at the output of the AF6 Board for interfacing with power board of different output power.

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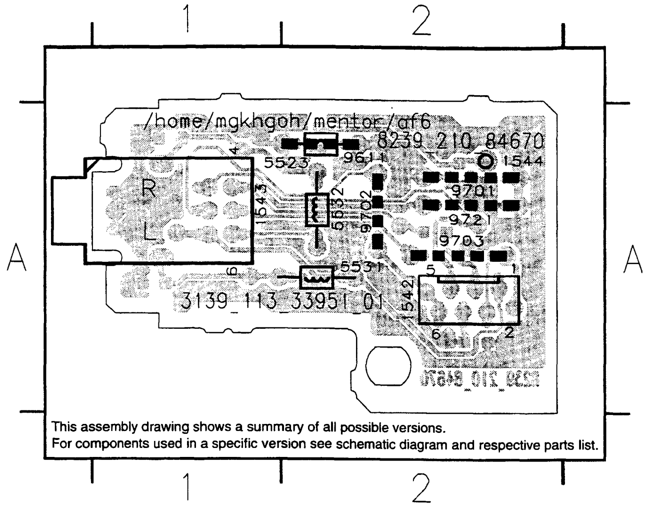
HEADPHONE BOARD - COMPONENT LAYOUT

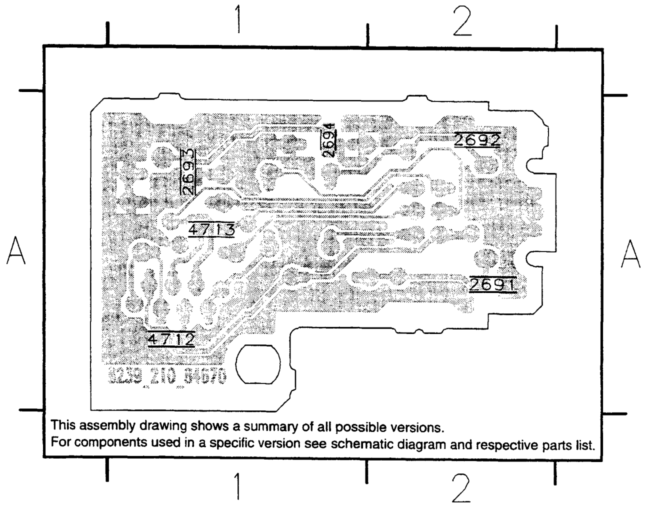
1542	A2	5523	A2	9611	A2	9703	A2
1543	A1	5531	A2	9701	A2	9721	A2
1544	A2	5532	A2	9702	A2		



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

HEADPHONE BOARD - CHIP LAYOUT

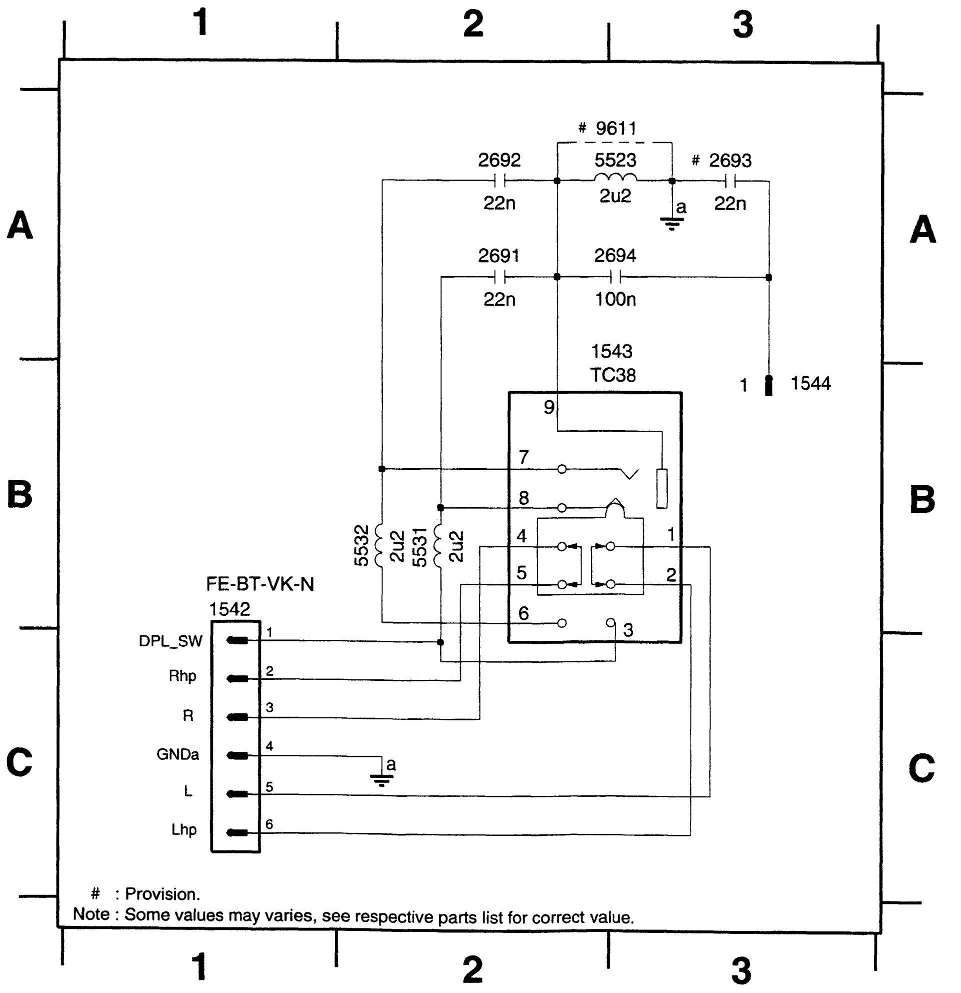
2691	A2	2693	A1	4712	A1
2692	A2	2694	A1	4713	A1



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

HEADPHONE BOARD - CIRCUIT DIAGRAM

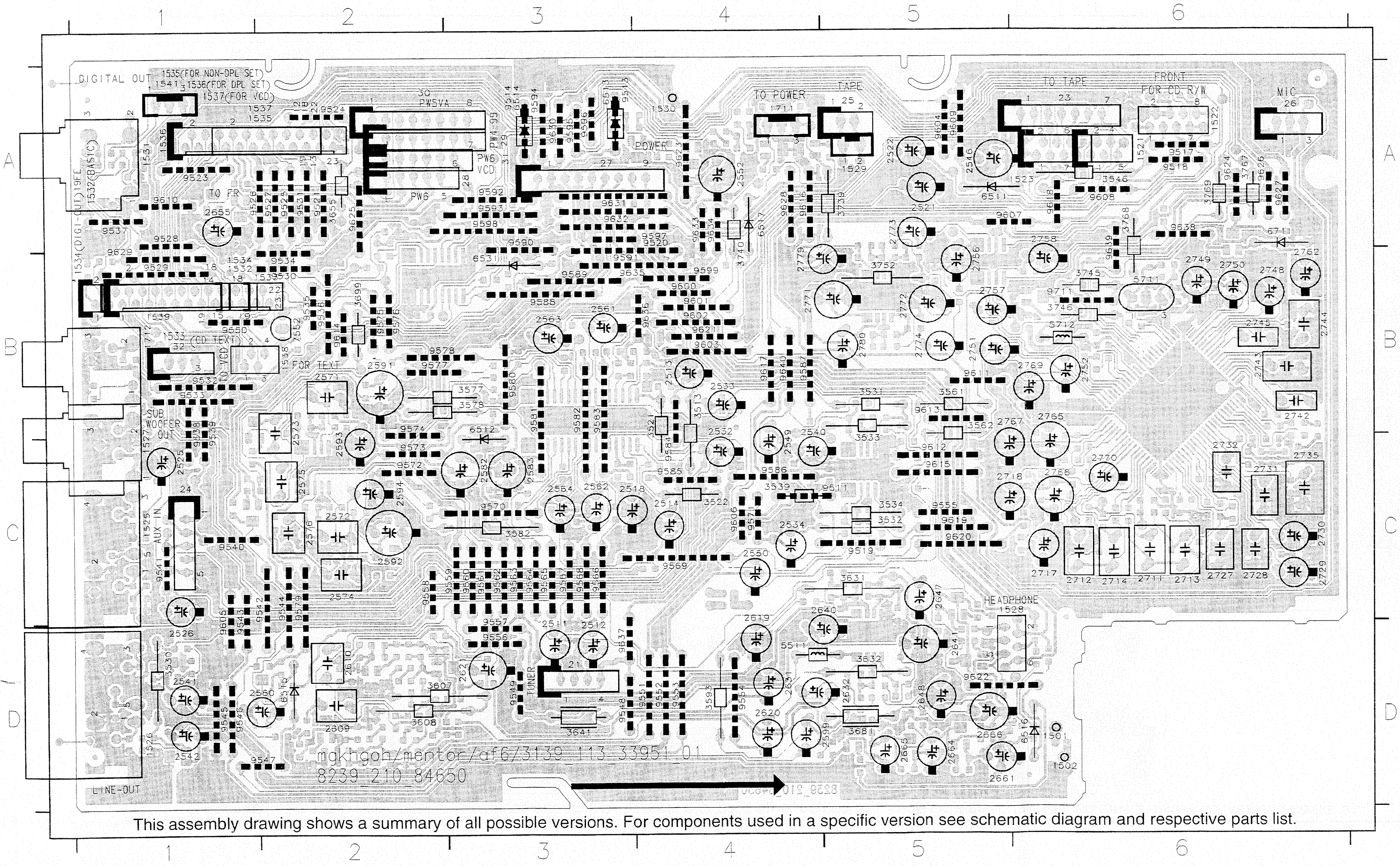
1542	B1	1544	B3	2692	A2	2694	A3	5531	B2	9611	A3
1543	A3	2691	A2	2693	A3	5523	A3	5532	B2		



: Provision.
Note : Some values may varies, see respective parts list for correct value.

AF6 BOARD - COMPONENT LAYOUT

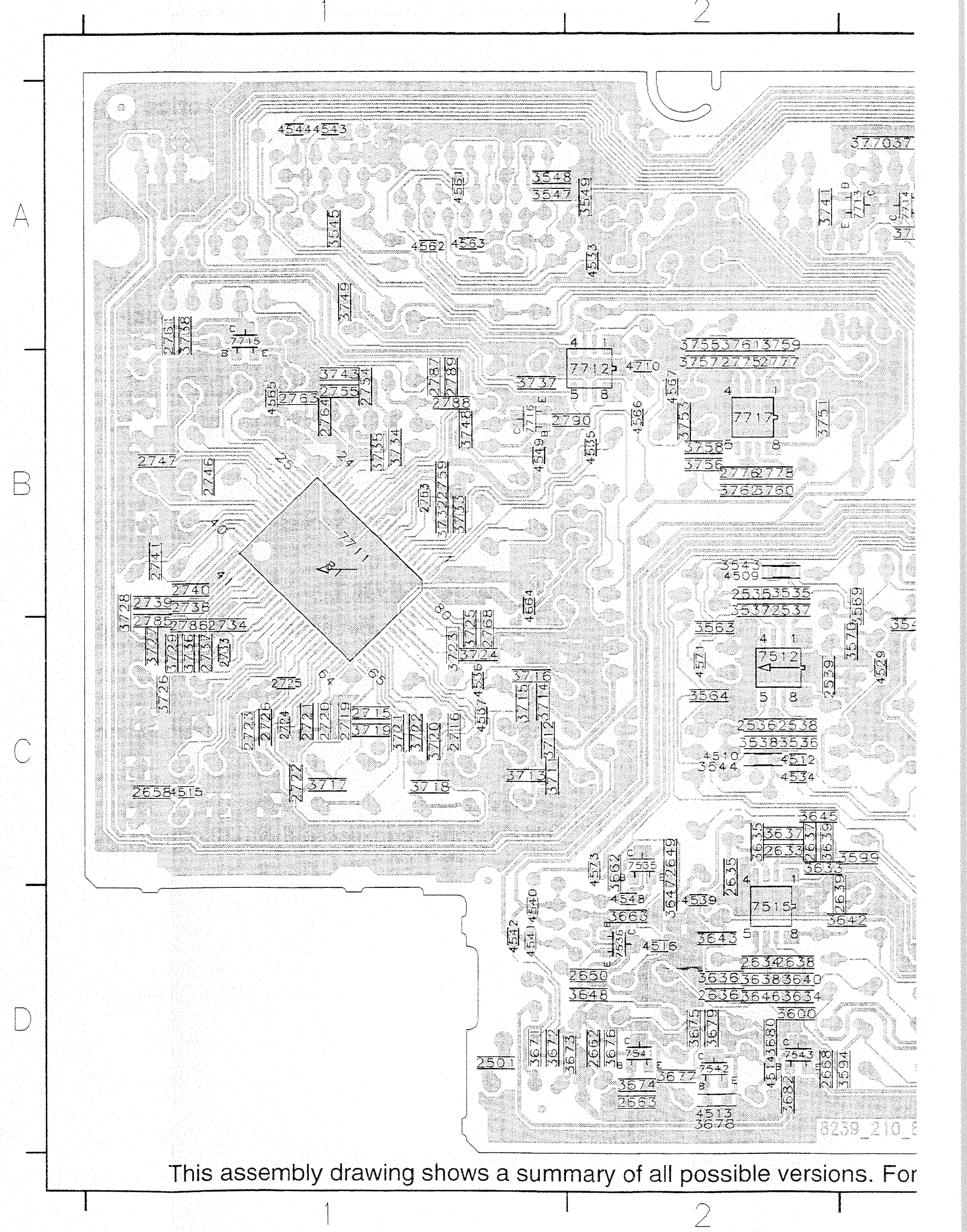
21 D3	1521 A6	1535 A2	2521 A5	2552 A4	2583 C3	2640 C5	2717 C6	2748 B6	2770 C6	3533 C5	3632 D5	5511 D4	9511 C5	9528 A1	9541 C1	9554 D4	9567 C3	9580 B3	9593 A3	9606 C4	9619 C5	9632 A3
23 A6	1522 A6	1536 A1	2522 A5	2560 D2	2591 B2	2641 D5	2718 C5	2749 B6	2771 B4	3534 C5	3641 D3	5711 B6	9513 A3	9529 B1	9542 C1	9555 C5	9568 C3	9581 B3	9594 A3	9607 A5	9620 C5	9633 A4
24 C1	1523 A6	1537 A2	2525 C1	2561 B3	2592 C2	2647 C5	2727 C6	2750 B6	2772 B5	3539 C4	3655 A2	5712 B6	9514 A3	9530 B2	9543 C1	9556 D3	9569 C4	9582 B3	9595 A3	9608 A6	9621 B4	9634 A4
25 A5	1525 C1	1538 B2	2526 D1	2562 C3	2593 C2	2648 D5	2728 C6	2751 B5	2773 A5	3546 A6	3681 D5	6511 A5	9517 A6	9531 A2	9544 C2	9557 C3	9570 C3	9583 B3	9596 A3	9609 A5	9622 D5	9635 B3
26 A6	1526 D1	1539 B1	2532 B4	2563 B3	2594 C2	2655 A1	2729 C6	2752 B6	2774 B5	3561 B5	3699 B2	6512 B3	9518 A6	9532 B1	9545 D1	9558 C2	9571 C4	9584 C4	9597 A4	9610 A1	9623 A4	9636 B4
27 A3	1527 C1	1541 A1	2533 B4	2564 C3	2599 D5	2661 D5	2730 C6	2756 B5	2779 B4	3562 B5	3739 A5	6513 A3	9519 C5	9533 B1	9546 D1	9559 C3	9572 C2	9585 C4	9598 A3	9611 B5	9624 A6	9637 D3
28 A3	1528 C5	1711 A4	2534 C4	2571 B2	2609 D2	2664 D5	2731 C6	2757 B5	2780 B5	3577 B3	3740 B4	6514 A3	9520 A4	9534 B2	9547 D2	9560 C3	9573 C2	9586 C4	9599 B4	9612 C5	9625 A2	9638 A6
29 A3	1529 A5	1712 B1	2540 B4	2572 C2	2610 D2	2665 D5	2732 C6	2758 A6	3513 B4	3578 B3	3745 B6	6515 D2	9521 A2	9535 B2	9548 D3	9561 C3	9574 B2	9587 B4	9600 B4	9613 B5	9626 A6	9639 B6
30 A2	1530 A4	2511 D3	2541 D1	2573 B2	2619 C4	2666 D5	2735 C6	2762 B6	3521 B4	3582 C3	3746 B6	6516 D6	9523 A1	9536 B2	9549 D3	9562 C3	9575 B2	9588 B3	9601 B4	9614 B2	9627 A6	9640 B4
31 A3	1531 A1	2512 D3	2542 D1	2574 C2	2620 D4	2711 C6	2742 B6	2765 B6	3522 C4	3593 D4	3752 B5	6517 A4	9524 A2	9537 A1	9550 B1	9563 C3	9576 B2	9589 B3	9602 B4	9615 C5	9628 A4	9711 B6
32 B1	1532 B1	2513 B4	2546 A5	2575 C2	2621 D3	2712 C6	2743 B6	2766 C6	3530 D1	3607 D2	3767 A6	6531 B3	9525 A2	9538 B1	9551 D4	9564 C3	9577 B2	9590 A3	9603 B4	9616 A4	9629 A1	
1501 D6	1533 B2	2514 C4	2549 C4	2576 C2	2631 D4	2713 C6	2744 B6	2767 B5	3531 B5	3608 D2	3768 A6	6711 A6	9526 A1	9539 B1	9552 D4	9565 C3	9578 B2	9591 B3	9604 A5	9617 B4	9630 A3	
1502 D6	1534 B1	2518 C3	2550 C4	2582 C3	2632 D5	2714 C6	2745 B6	2769 B6	3532 C5	3631 C5	3769 A6	7552 B2	9527 A2	9540 C1	9553 D4	9566 C3	9579 C2	9592 A3	9605 C1	9618 A6	9631 A3	



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

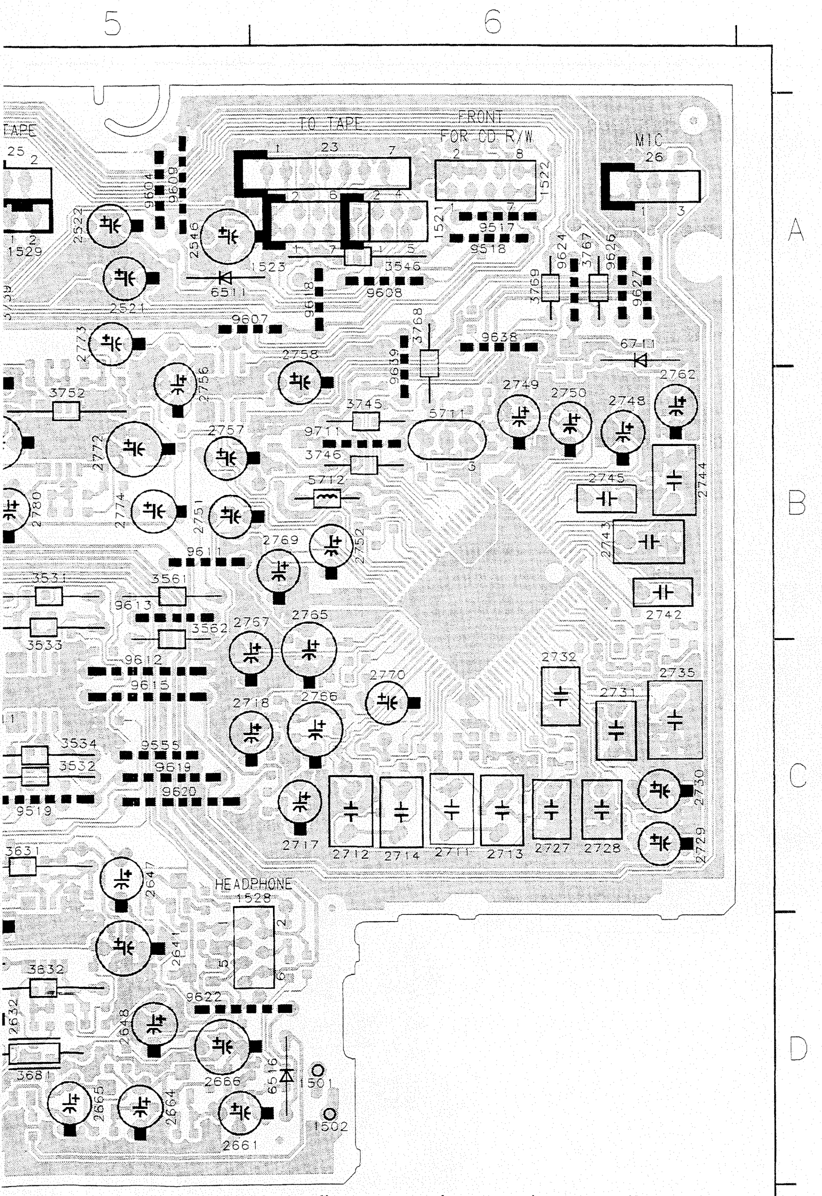
AF6 BOARD - CHIP LAYOUT

2501 D1	2543 D6	2598 C5	2624 C4	2669 C6	2726 C1	2768 C1	3516 C3	3542 C3	3563 C2
2515 B3	2544 D6	2601 D5	2633 C2	2681 B5	2733 C1	2775 B2	3517 B4	3543 B2	3564 C2
2516 C3	2545 D6	2602 D5	2634 D2	2682 B6	2734 C1	2776 B2	3518 C4	3544 C2	3565 B4
2517 B3	2547 D6	2603 D5	2635 C2	2683 B6	2737 C1	2777 B2	3519 A3	3545 A1	3566 C4
2519 B4	2548 D6	2604 D5	2636 D2	2685 A6	2738 B1	2778 B2	3520 A3	3547 A1	3567 B4
2520 C4	2551 A3	2605 D5	2637 C2	2686 A6	2739 B1	2781 A5	3523 C6	3548 A1	3568 C4
2523 B3	2553 A4	2606 D5	2638 D2	2687 A6	2740 B1	2785 C1	3524 C6	3549 A2	3569 B3
2524 C3	2565 B4	2607 D5	2639 D2	2688 A5	2741 B1	2786 C1	3525 C6	3550 C6	3570 C3
2527 C6	2566 C4	2608 D5	2649 C2	2689 A5	2746 B1	2787 B1	3526 C6	3551 A3	3571 B5
2528 C6	2577 B4	2611 D5	2650 D2	2715 C1	2747 B1	2788 B1	3527 D6	3552 A3	3572 C5
2529 C6	2578 C4	2612 D5	2651 A3	2716 C1	2753 B1	2789 B1	3528 D6	3553 A4	3573 B5
2530 B4	2579 B4	2613 D5	2652 A4	2719 C1	2754 B1	2790 B2	3529 D6	3554 A3	3574 C5
2531 C3	2580 C4	2614 D5	2656 A5	2720 C1	2755 B1	3501 C3	3535 B2	3555 A3	3575 B4
2535 B2	2581 C4	2615 D4	2657 B5	2721 C1	2759 B1	3502 C3	3536 C2	3556 A3	3576 C4
2536 C2	2584 B4	2616 D5	2658 C1	2722 C1	2760 B6	3511 B4	3537 B2	3557 A3	3580 C4
2537 B2	2595 B5	2617 C5	2662 D2	2723 C1	2761 A1	3512 C4	3538 C2	3558 C5	3581 B4
2538 C2	2596 C5	2618 D5	2663 D2	2724 C1	2763 B1	3514 C3	3540 C6	3559 D5	3583 B5
2539 C2	2597 B5	2623 B5	2668 D2	2725 C1	2764 B1	3515 B3	3541 C3	3560 D5	3584 C5



This assembly drawing shows a summary of all possible versions. For

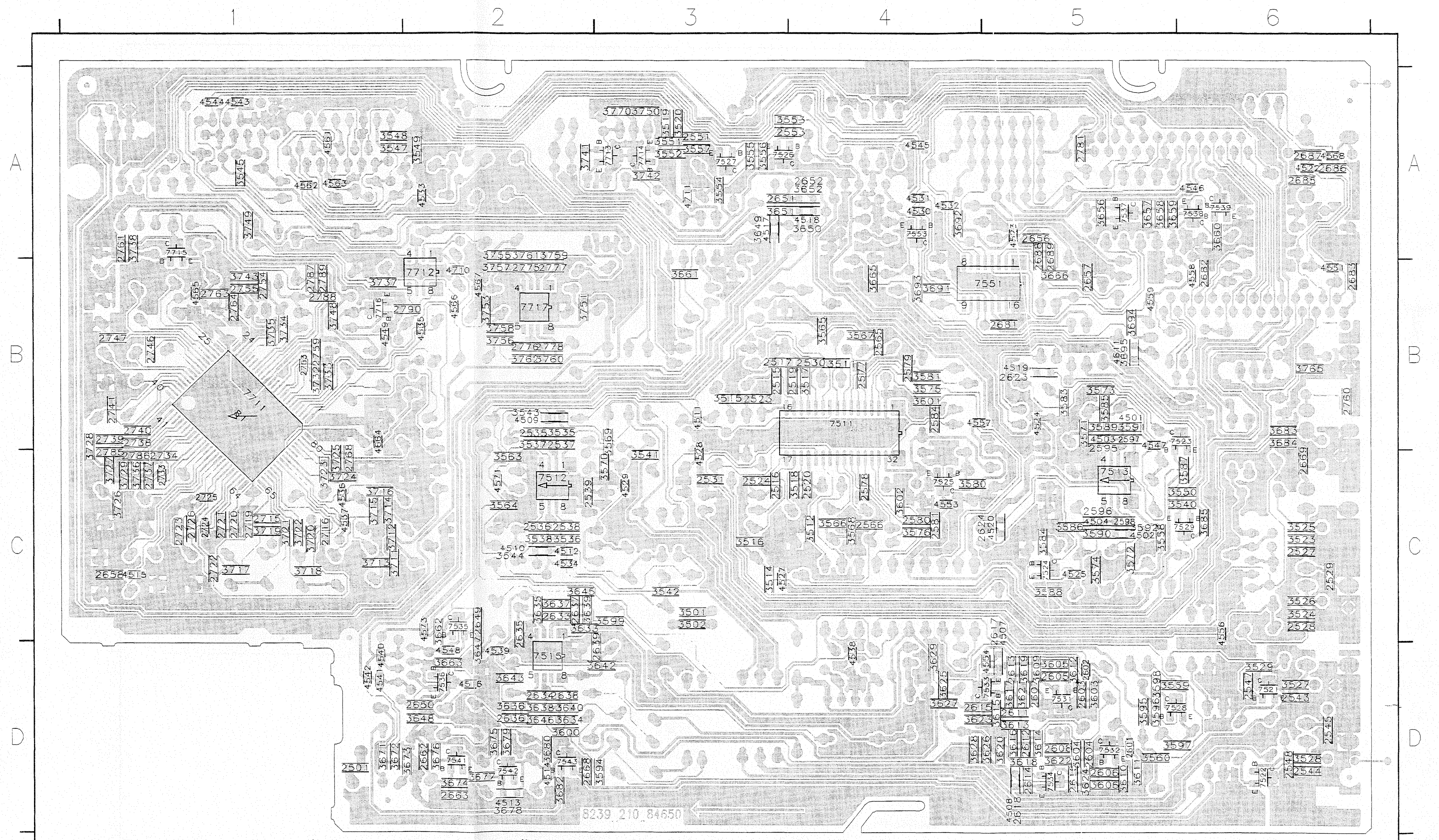
C5	9528 A1	9541 C1	9554 D4	9567 C3	9580 B3	9593 A3	9606 C4	9619 C5	9632 A3
A3	9529 B1	9542 C1	9555 C5	9568 C3	9581 B3	9594 A3	9607 A5	9620 C5	9633 A4
A3	9530 B2	9543 C1	9556 D3	9569 C4	9582 B3	9595 A3	9608 A6	9621 B4	9634 A4
A6	9531 A2	9544 C2	9557 C3	9570 C3	9583 B3	9596 A3	9609 A5	9622 D5	9635 B3
A6	9532 B1	9545 D1	9558 C2	9571 C4	9584 C4	9597 A4	9610 A1	9623 A4	9636 B4
C5	9533 B1	9546 D1	9559 C3	9572 C2	9585 C4	9598 A3	9611 B5	9624 A6	9637 D3
A4	9534 B2	9547 D2	9560 C3	9573 C2	9586 C4	9599 B4	9612 C5	9625 A2	9638 A6
A2	9535 B2	9548 D3	9561 C3	9574 B2	9587 B4	9600 B4	9613 B5	9626 A6	9639 B6
A1	9536 B2	9549 D3	9562 C3	9575 B2	9588 B3	9601 B4	9614 B2	9627 A6	9640 B4
A2	9537 A1	9550 B1	9563 C3	9576 B2	9589 B3	9602 B4	9615 C5	9628 A4	9711 B6
A2	9538 B1	9551 D4	9564 C3	9577 B2	9590 A3	9603 B4	9616 A4	9629 A1	
A1	9539 B1	9552 D4	9565 C3	9578 B2	9591 B3	9604 A5	9617 B4	9630 A3	
A2	9540 C1	9553 D4	9566 C3	9579 C2	9592 A3	9605 C1	9618 A6	9631 A3	



ecific version see schematic diagram and respective parts list.

AF6 BOARD - CHIP LAYOUT

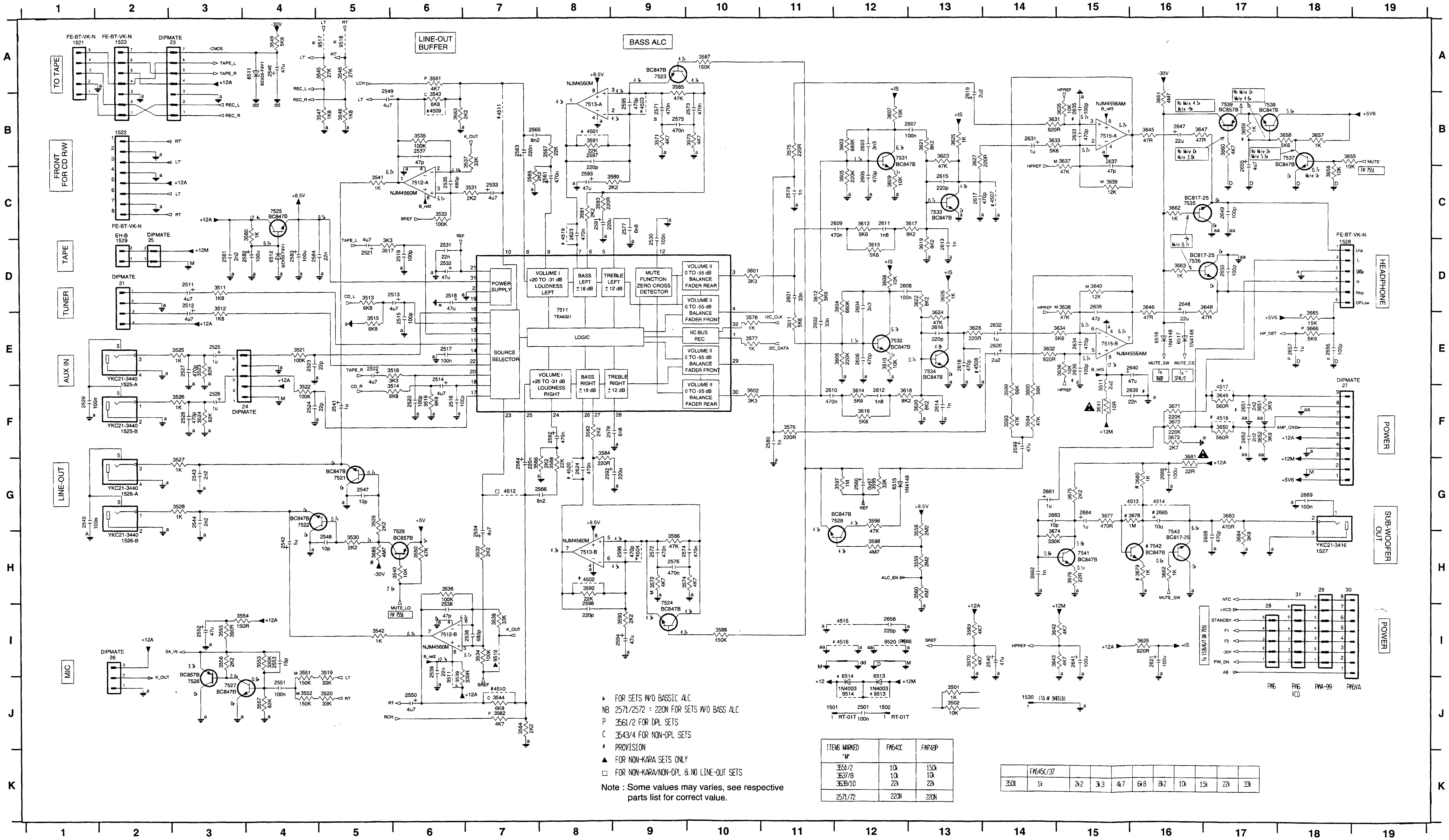
2501 D1	2543 D6	2598 C5	2624 C4	2669 C6	2726 C1	2768 C1	3516 C3	3542 C3	3563 C2	3585 B5	3604 D5	3624 D5	3647 D2	3673 D2	3712 C1	3732 B1	3758 B2	4514 D2	4534 C2	4554 D5	7511 B4	7536 D2
2515 B3	2544 D6	2601 D5	2633 C2	2681 B5	2733 C1	2775 B2	3517 B4	3543 B2	3564 C2	3586 C5	3605 D5	3625 D4	3648 D2	3674 D2	3713 C1	3733 B1	3759 A2	4515 C1	4535 B2	4556 C6	7512 C2	7537 A5
2516 C3	2545 D6	2602 D5	2634 D2	2682 B6	2734 C1	2776 B2	3518 C4	3544 C2	3565 B4	3587 C6	3606 D5	3626 D5	3649 A3	3675 D2	3714 C1	3734 B1	3760 B2	4516 D2	4536 C1	4557 B4	7513 C5	7538 A6
2517 B3	2547 D6	2603 D5	2635 C2	2683 B6	2737 C1	2777 B2	3519 A3	3545 A1	3566 C4	3588 C5	3609 D5	3627 D4	3650 A4	3676 D2	3715 C1	3735 B1	3761 A2	4517 A3	4537 C1	4558 B6	7515 D2	7539 A6
2519 B4	2548 D6	2604 D5	2636 D2	2685 A6	2738 B1	2778 B2	3520 A3	3547 A1	3567 B4	3589 B5	3610 D5	3628 D4	3651 A3	3677 D2	3716 C1	3736 C1	3762 B2	4518 A4	4538 D4	4559 B5	7521 D6	7541 D2
2520 C4	2551 A3	2605 D5	2637 C2	2686 A6	2739 B1	2781 A5	3523 C6	3548 A1	3568 C4	3590 C5	3611 D5	3629 D4	3652 A4	3678 D2	3717 C1	3737 B1	3765 B6	4519 B5	4539 D2	4561 A1	7522 D6	7542 D2
2523 B3	2553 A4	2606 D5	2638 D2	2687 A6	2740 B1	2785 C1	3524 C6	3549 A2	3569 B3	3591 B5	3612 D5	3633 C2	3656 A5	3679 D2	3718 C1	3738 A1	3770 A3	4520 C5	4540 D1	4562 A1	7523 B6	7543 D2
2524 C3	2565 B4	2607 D5	2639 D2	2688 A5	2741 B1	2786 C1	3525 C6	3550 C6	3570 C3	3592 C5	3613 D5	3634 D2	3657 A5	3680 D2	3719 C1	3741 A2	4501 B5	4522 A6	4541 D1	4563 A1	7524 C5	7551 B5
2527 C6	2566 C4	2608 D5	2649 C2	2689 A5	2746 B1	2787 B1	3526 C6	3551 A3	3571 B5	3594 D3	3614 D5	3635 C2	3658 A5	3682 D2	3720 C1	3742 A3	4502 C5	4523 A5	4542 D1	4565 B1	7525 C4	7553 A4
2528 C6	2577 B4	2611 D5	2650 D2	2715 C1	2747 B1	2788 B1	3527 D6	3552 A3	3572 C5	3595 D5	3615 D5	3636 D2	3659 A5	3683 B6	3721 C1	3743 B1	4503 B5	4524 B5	4543 A1	4566 B2	7526 A3	7711 B1
2529 C6	2578 C4	2612 D5	2651 A3	2716 C1	2753 B1	2789 B1	3528 D6	3553 A4	3573 B5	3596 D5	3616 D5	3637 C2	3660 A5	3684 B6	3722 C1	3748 B1	4504 C5	4525 C5	4544 A1	4567 B2	7527 A3	7712 B2
2530 B4	2579 B4	2613 D5	2652 A4	2719 C1	2754 B1	2790 B2	3529 D6	3554 A3	3574 C5	3597 D5	3617 D5	3638 D2	3661 B5	3685 C6	3723 C1	3749 A1	4507 C5	4527 C3	4545 A4	4568 A6	7528 D5	7713 A3
2531 C3	2580 C4	2614 D5	2656 A5	2720 C1	2755 B1	3501 C3	3535 B2	3555 A3	3575 B4	3598 D5	3618 D5	3639 C2	3662 C2	3691 B4	3724 C1	3750 A3	4508 D5	4528 C3	4546 A6	4571 C2	7529 C6	7714 A3
2535 B2	2581 C4	2615 D4	2657 B5	2721 C1	2759 B1	3502 C3	3536 C2	3556 A3	3576 C4	3599 C3	3619 D5	3640 D2	3663 D2	3692 A4	3725 C1	3751 B2	4509 B2	4529 C3	4547 B5	4573 C2	7531 D5	7715 A1
2536 C2	2584 B4	2616 D5	2658 C1	2722 C1	2760 B6	3511 B4	3537 B2	3557 A3	3580 C4	3600 D2	3620 D5	3642 D3	3665 B4	3693 B4	3726 C1	3753 B2	4510 C2	4530 A4	4548 D2	4611 B5	7532 D5	7716 B1
2537 B2	2595 B5	2617 C5	2662 D2	2723 C1	2761 A1	3512 C4	3538 C2	3558 C5	3581 B4	3601 B4	3621 D5	3643 D2	3666 B5	3694 B5	3727 C1	3755 A2	4511 B3	4531 A4	4549 B1	4664 B1	7533 D5	7717 B2
2538 C2	2596 C5	2618 D5	2663 D2	2724 C1	2763 B1	3514 C3	3540 C6	3559 D5	3583 B5	3602 C4	3622 D5	3645 C2	3671 D1	3695 B5	3728 B1	3756 B2	4512 C2	4532 A4	4551 B6	4710 B2	7534 D5	
2539 C2	2597 B5	2623 B5	2668 D2	2725 C1	2764 B1	3515 B3	3541 C3	3560 D5	3584 C5	3603 D5	3623 D4	3646 D2	3672 D1	3711 C1	3729 C1	3757 B2	4513 D2	4533 A2	4553 C4	4711 A3	7535 C2	



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF6 BOARD - CIRCUIT DIAGRAM (PART 1)

21 D2
23 A3
24 F3
25 C2
26 I2
27 E18
28 I17
29 H18
30 H18
31 H18
1501 J12
1502 J12
1521 A1
1522 B2
1523 A2
1525-A E2
1525-B F2
1526-A G2
1526-B H2
1527 H18
1528 D18
1529 C2
1530 J14
2501 J12
2511 D3
2512 D3
2513 D6
2514 E6
2515 E6
2516 F6
2517 E6
2518 D6
2519 D6
2520 F6
2521 D5
2522 E5
2523 E4
2524 F4
2525 E3
2526 F3
2527 E3
2528 F3
2529 F1
2530 D9
2531 D6
2532 D6
2533 C7
2534 H7
2535 C6
2536 I7
2537 B6
2538 I6
2539 I6
2540 I14
2541 F5
2542 H4
2543 G3
2544 G3
2545 G1
2546 A4
2547 G5
2548 H5
2549 B5
2550 J6
2551 J4
2552 I3
2553 I4
2560 G12
2561 C8
2562 F8
2563 B7
2564 G7
2565 B7
2566 G8
2571 B9
2572 H9
2573 B10
2574 H9
2575 B9
2576 H9
2577 C9
2578 F8
2579 C11
2580 F11
2581 D3
2582 D4
2583 D4
2584 D4
2591 C8
2592 G8
2593 C8
2594 I9
2595 B9
2596 H9
2597 B8
2598 I8
2599 F14
2601 D11
2602 E11
2603 B12
2604 D12
2605 C12
2606 E12
2607 B13
2608 D12
2609 C12
2610 F11
2611 C12
2612 F12
2613 D13
2614 F13
2615 C13
2616 E13
2617 C13
2618 E13
2619 B13
2620 E14
2621 I16
2623 C8
2624 G8
2631 B14
2632 E14
2633 B15
2634 E15
2635 B15
2636 E15
2637 B15
2638 D15
2639 F16
2640 E16
2641 I15
2647 B16
2648 D16
2649 C17
2650 D17
2651 F17
2652 F17
2655 C17
2656 E18
2657 E18
2658 I12
2661 G14
2662 H14
2663 G14
2664 G15
2665 G16
2666 G16
2668 H17
2669 G18
3501 J13
3502 J13
3511 D3
3512 D3
3513 D5
3514 F6
3515 E5
3516 F6
3517 D5
3518 E6
3519 I5
3520 J5
3521 E4
3522 F4
3523 E3
3524 F3
3525 E3
3526 F3
3527 G3
3528 G3
3529 G5
3530 H5
3531 C7
3532 H7
3533 C6
3534 I7
3535 B6
3536 H6
3537 B7
3538 I7
3539 J6
3540 H6
3541 C5
3542 I5
3543 B6
3544 J7
3545 A5
3546 A5
3547 B5
3548 B5
3549 A4
3550 H6
3551 I4
3552 J4
3553 I4
3554 I3
3555 I3
3556 I3
3557 J4
3558 H13
3559 H13
3560 H13
3561 A6
3562 J7
3563 B6
3564 J7
3565 C7
3566 G7
3567 B8
3568 G8
3569 I13
3570 I13
3571 B9
3572 H9
3573 B10
3574 H9
3575 B11
3576 F11
3577 E10
3578 E10
3580 C4
3581 C8
3582 F8
3583 C8
3584 F8
3585 A9
3586 H9
3587 A10
3588 I10
3589 C9
3590 I9
3591 B8
3592 H8
3593 F14
3594 F14
3595 G12
3596 G12
3597 G12
3598 H12
3599 F14
3600 F14
3601 D10
3602 F10
3603 B12
3604 D12
3605 C12
3606 E12
3607 B12
3608 D12
3609 C12
3610 E12
3611 E11
3612 D11
3613 C12
3614 F12
3615 D12
3616 F12
3617 C13
3618 F12
3619 D13
3620 F13
3621 B13
3622 D13
3623 B13
3624 E13
3625 B13
3626 D13
3627 B13
3628 E13
3629 I16
3631 B14
3632 E14
3633 B14
3634 E15
3635 B15
3636 E15
3637 B15
3638 D15
3639 C15
3640 D15
3641 F15
3642 I14
3643 I14
3645 B16
3646 D16
3647 B16
3648 D17
3649 F17
3650 F17
3651 F17
3652 F17
3655 B18
3656 C18
3657 B18
3658 B18
3659 B17
3660 B17
3661 B16
3662 C16
3663 D16
3665 E18
3666 E18
3671 F16
3672 F16
3673 F16
3674 H14
3675 G15
3676 H15
3677 G15
3678 G16
3679 H16
3680 G16
3681 G16
3682 H16
3683 G17
3684 H17
3685 H5
4501 B8
4502 H8
4503 B9
4504 H9
4507 C14
4508 E13
4509 B6
4510 J7
4511 B7
4512 G7
4513 G16
4514 G16
4515 I12
4516 I12
4517 F17
4518 F17
4519 C8
4520 G8
5511 F15
6511 A4
6512 D4
6513 J12
6514 J12
6515 G12
6516 E16
6517 E16
7511 D8
7512-A C6
7512-B I6
7513-A B8
7513-B H8
7515-A B15
7515-B E15
7521 G5
7522 G4
7523 A9
7524 H9
7525 C4
7526 J3
7527 J3
7528 G11
7529 H6
7531 B12
7532 E12
7533 C13
7534 E13
7535 C16
7536 D16
7537 B18
7538 B17
7539 B17
7541 H15
7542 H16
7543 H16
9511 J6
9513 J12
9514 J12
9517 A5
9518 A5
9519 I7
9520 I12


LINE-OUT BUFFER
BASS ALC
TO TAPE
FRONT FOR CD R/W
TAPE
TUNER
AUX IN
LINE-OUT
MIC
HEADPHONE
POWER
SUB-WOOFER OUT
SOURCE SELECTOR
POWER SUPPLY
LOGIC
VOLUME I +20 TO -31 dB LOUDNESS LEFT
BASS LEFT ±18 dB
TREBLE LEFT ±12 dB
MUTE FUNCTION ZERO CROSS DETECTOR
VOLUME I +20 TO -31 dB LOUDNESS RIGHT
BASS RIGHT ±18 dB
TREBLE RIGHT ±12 dB
VOLUME II 0 TO -55 dB BALANCE FADER REAR
VOLUME II 0 TO -55 dB BALANCE FADER FRONT
IIC BUS REC
7511 TEA6321
NJM4560M
NJM4556AM
BC847B
BC857B
BC817-25
FE-BT-VK-N
DIPMATE
YKC21-3440
YKC21-3416
FW6
FW6 VCD
FW-99
FW6VA

- * FOR SETS W/O BASSIC ALC
- NB 2571/2572 = 220N FOR SETS W/O BASS ALC
- P 3561/2 FOR DPL SETS
- C 3543/4 FOR NON-DPL SETS
- # PROVISION
- ▲ FOR NON-KARA SETS ONLY
- □ FOR NON-KARA/NON-DPL & NO LINE-OUT SETS

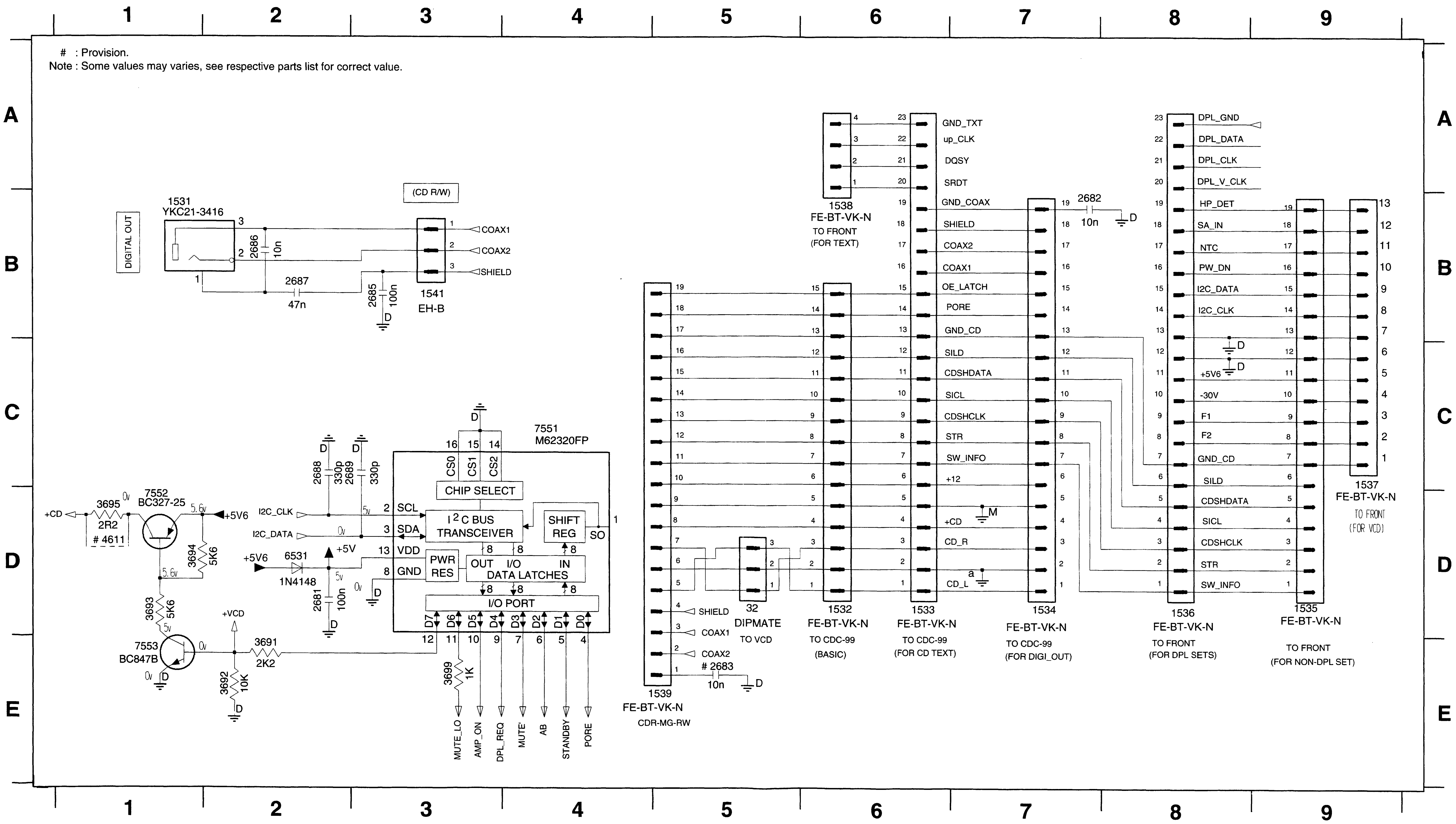
Note : Some values may varies, see respective parts list for correct value.

ITEMS MARKED "M"	FW540C	FW748P
3551/2 3637/8 3639/10	10k 10k 22k	150k 10k 22k
2571/72	220N	220N

	FW545C/37									
3501	1k	2k2	3k3	4k7	6k8	8k2	10k	15k	22k	33k

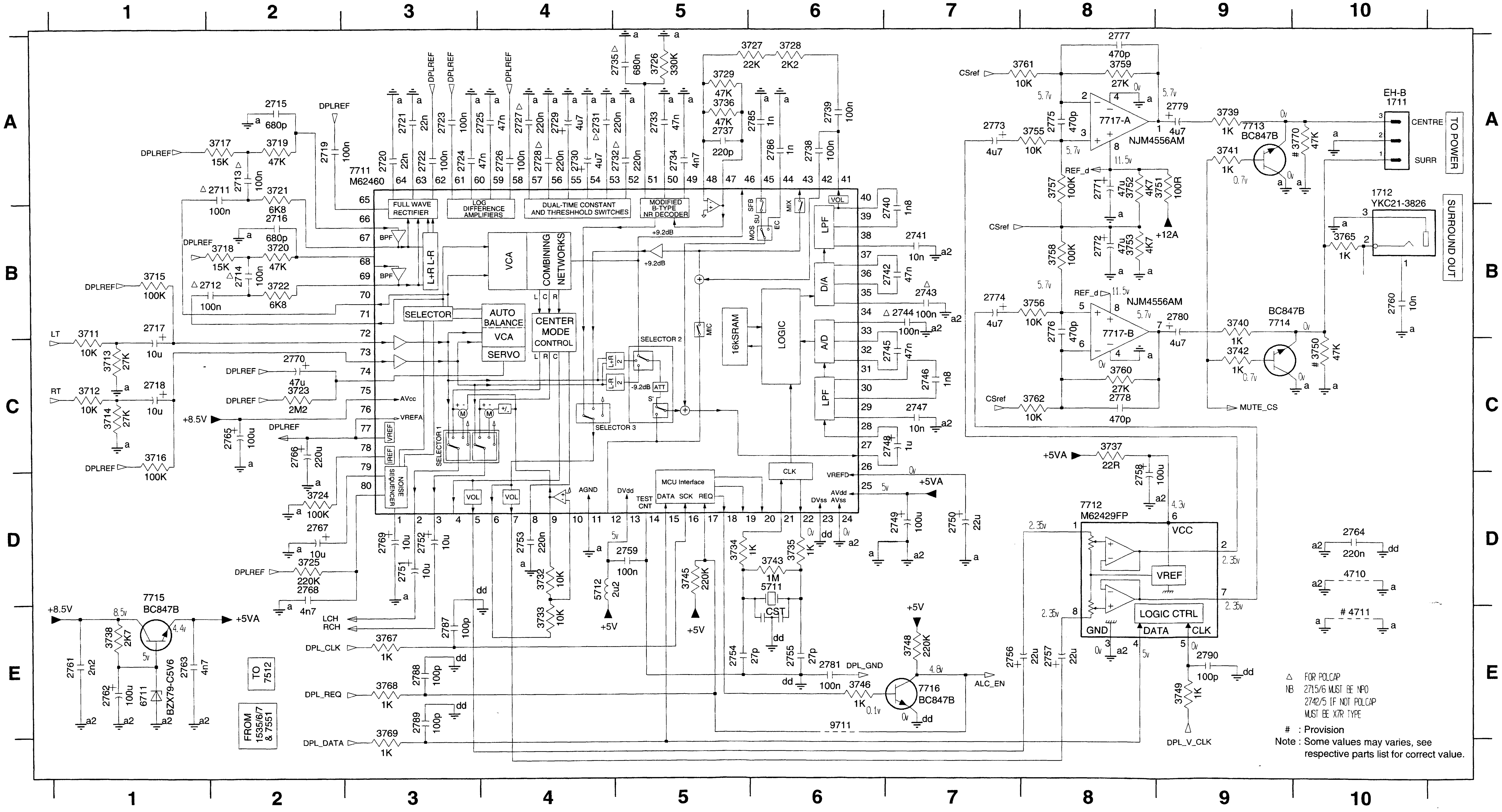
AF6 BOARD - CIRCUIT DIAGRAM (PART 2)

32 D5	1532 D6	1534 D7	1536 D8	1538 B6	1541 B3	2682 B7	2685 B3	2687 B2	2689 C3	3692 E2	3694 D1	3699 E3	6531 D2	7552 D1
1531 B1	1533 D6	1535 D9	1537 C9	1539 E5	2681 D2	2683 E5	2686 B2	2688 C2	3691 E2	3693 D1	3695 D1	4611 D1	7551 C4	7553 E1


: Provision.
Note : Some values may varies, see respective parts list for correct value.
1 2 3 4 5 6 7 8 9
A B C D E
DIGITAL OUT
1531
YKC21-3416
2686 10n
2687 47n
2685 100n
(CD R/W)
COAX1
COAX2
SHIELD
1541
EH-B
7551
M62320FP
CS0 CS1 CS2
CHIP SELECT
SCL
SDA
VDD
GND
I2C BUS TRANSCEIVER
SHIFT REG
SO
PWR RES
OUT I/O IN
DATA LATCHES
I/O PORT
D7 D6 D5 D4 D3 D2 D1 D0
I2C_CLK
I2C_DATA
2688 330p
2689 330p
+5V6
6531
1N4148
+5V
2681 100n
+CD
3695 2R2
# 4611
7552
BC327-25
3694 5K6
3693 5K6
7553
BC847B
+VCD
3691 2K2
3692 10K
3699 1K
MUTE_LO
AMP_ON
DPL_REQ
MUTE'
AB
STANDBY
PORE
1539
FE-BT-VK-N
CDR-MG-RW
SHIELD
COAX1
COAX2
# 2683 10n
32
DIPMATE
TO VCD
1532
FE-BT-VK-N
TO CDC-99
(BASIC)
1538
FE-BT-VK-N
TO FRONT
(FOR TEXT)
1533
FE-BT-VK-N
TO CDC-99
(FOR CD TEXT)
GND_TXT
up_CLK
DQSY
SRDT
GND_COAX
SHIELD
COAX2
COAX1
OE_LATCH
PORE
GND_CD
SILD
CDSHDATA
SICL
CDSHCLK
STR
SW_INFO
+12
+CD
CD_R
CD_L
M
a
2682 10n
1534
FE-BT-VK-N
TO CDC-99
(FOR DIGI_OUT)
1536
FE-BT-VK-N
TO FRONT
(FOR DPL SETS)
DPL_GND
DPL_DATA
DPL_CLK
DPL_V_CLK
HP_DET
SA_IN
NTC
PW_DN
I2C_DATA
I2C_CLK
+5V6
-30V
F1
F2
GND_CD
SILD
CDSHDATA
SICL
CDSHCLK
STR
SW_INFO
1535
FE-BT-VK-N
TO FRONT
(FOR NON-DPL SET)
1537
FE-BT-VK-N
TO FRONT
(FOR VCD)
D

DOLBY PROLOGIC (DPL) - CIRCUIT DIAGRAM

1711	A10
1712	A10
2711	A2
2712	B2
2713	A2
2714	B2
2715	A2
2716	B2
2717	B1
2718	C1
2719	A2
2720	A3
2721	A3
2722	A3
2723	A3
2724	A3
2725	A4
2726	A4
2727	A4
2728	A4
2729	A4
2730	A4
2731	A4
2732	A5
2733	A5
2734	A5
2735	A5
2737	A5
2738	A6
2739	A6
2740	B7
2741	B7
2742	B7
2743	B7
2744	B7
2745	C7
2746	C7
2747	C7
2748	C7
2749	D7
2750	D7
2751	D3
2752	D3
2753	D4
2754	E5
2755	E6
2756	E7
2757	E8
2758	D8
2759	D5
2760	B10
2761	E1
2762	E1
2763	E1
2764	D10
2765	C2
2766	C2
2767	D2
2768	D2
2769	D3
2770	C2
2771	A8
2772	B8
2773	A7
2774	B7
2775	A8
2776	B8
2777	A8
2778	C8
2779	A9
2780	B9
2781	E6
2785	A6
2786	A6
2787	E3
2788	E3
2789	E3
2790	E9
3711	B1
3712	C1
3713	C1
3714	C1
3715	B1
3716	C1
3717	A2
3718	B2
3719	A2
3720	B2
3721	A2
3722	B2
3723	C2
3724	D2
3725	D2
3726	A5
3727	A6
3728	A6
3729	A5
3732	D4
3733	E4
3734	D5
3735	D6
3736	A5
3737	C8
3738	E1
3739	A9
3740	B9
3741	A9
3742	C9
3743	D6
3745	D5
3746	E6
3748	E7
3749	E9
3750	C10
3751	A9
3752	A8
3753	B8
3755	A8
3756	B8
3757	A8
3758	B8
3759	A8
3760	C8
3761	A8
3762	C8
3765	B10
3767	E3
3768	E3
3769	E3
3770	A10
4710	D10
4711	E10
5711	D6
5712	D4
6711	E1
7711	A3
7712	D8
7713	A9
7714	B9
7715	D1
7716	E7
7717-A	A8
7717-B	B8
9711	E6


1 2 3 4 5 6 7 8 9 10
A B C D E
7711
M62460
FULL WAVE RECTIFIER
LOG DIFFERENCE AMPLIFIERS
DUAL-TIME CONSTANT AND THRESHHOLD SWITCHES
MODIFIED B-TYPE NR DECODER
VCA
COMBINING NETWORKS
SELECTOR
AUTO BALANCE
VCA
SERVO
CENTER MODE CONTROL
SELECTOR 1
SELECTOR 2
SELECTOR 3
NOISE SEQUENCER
16kSRAM
LOGIC
LPF
D/A
A/D
CLK
MCU Interface
DATA SCK REQ
VOL
MIC
DPLREF
LT
RT
+8.5V
+5VA
+5V
LCH
RCH
DPL_CLK
DPL_REQ
DPL_DATA
DPL_GND
ALC_EN
DPL_V_CLK
CSref
MUTE_CS
TO 7512
FROM 1535/6/7 & 7551
7715
BC847B
BZX79-C5V6
7716
BC847B
7717-A
7717-B
NJM4556AM
7712
M62429FP
VCC
VREF
LOGIC CTRL
GND
DATA
CLK
7713
BC847B
7714
BC847B
EH-B
1711
CENTRE
SURR
TO POWER
1712
YKC21-3826
SURROUND OUT
△ FOR POLCAP
NB 2715/6 MUST BE NPO
2742/5 IF NOT POLCAP
MUST BE X7R TYPE
# : Provision
Note : Some values may varies, see respective parts list for correct value.

ELECTRICAL PARTS LIST - AF6 BOARD

MISCELLANEOUS

1523	4822 267 10953	Flex Connector 7P
1525	4822 267 20452	Cinch Socket - Aux in
1526	4822 267 20452	Cinch Socket - Line-out
1527	4822 267 31729	Cinch Socket - Sub-Woofer out
1528	4822 267 10731	Flex Connector 6P
1531	4822 267 31729	Cinch Socket - Digital out
1532	4822 265 10981	Flex Connector 15P
1534	4822 265 11553	Flex Connector 19P
1536	4822 267 10757	Flex Connector 23P
1542	4822 267 10731	Flex Connector 6P
1543	4822 265 11529	Headphone Socket
1712	4822 265 10913	Cinch Socket - Surround out

CAPACITORS

2501	4822 126 13196	100nF 10% 25V
2511	4822 124 40246	4,7μF 20% 63V
2512	4822 124 40246	4,7μF 20% 63V
2513	4822 124 40246	4,7μF 20% 63V
2514	4822 124 40246	4,7μF 20% 63V
2515	5322 122 32531	100pF 5% 50V
2516	5322 122 32531	100pF 5% 50V
2517	4822 126 13196	100nF 10% 25V
2518	4822 124 40433	47μF 20% 25V
2519	5322 122 32531	100pF 5% 50V
2520	5322 122 32531	100pF 5% 50V
2521	4822 124 40246	4,7μF 20% 63V
2522	4822 124 40246	4,7μF 20% 63V
2523	5322 122 32658	22pF 5% 50V
2524	5322 122 32658	22pF 5% 50V
2525	4822 124 40242	1μF 20% 63V
2526	4822 124 40242	1μF 20% 63V
2527	5322 122 34099	470pF 10% 63V
2528	5322 122 34099	470pF 10% 63V
2529	4822 126 10002	100nF 20% 25V
2530	4822 126 13196	100nF 10% 25V
2531	4822 122 33809	22nF 20% 50V
2532	4822 124 40433	47μF 20% 25V
2533	4822 124 40246	4,7μF 20% 63V
2534	4822 124 40246	4,7μF 20% 63V
2535	4822 122 32535	680pF 10% 63V
2536	4822 122 32535	680pF 10% 63V
2537	4822 126 13692	47pF 1% 63V
2538	4822 126 13692	47pF 1% 63V
2539	4822 122 33809	22nF 20% 50V
2540	4822 124 40433	47μF 20% 25V
2541	4822 124 40242	1μF 20% 63V
2542	4822 124 40242	1μF 20% 63V
2543	4822 122 33175	2,2nF 20% 50V
2544	4822 122 33175	2,2nF 20% 50V
2545	4822 126 10002	100nF 20% 25V
2546	4822 124 41751	47μF 20% 50V
2547	5322 122 32448	10pF 5% 50V
2548	5322 122 32448	10pF 5% 50V
2549	4822 124 40246	4,7μF 20% 63V
2550	4822 124 40246	4,7μF 20% 63V
2551	4822 126 13196	100nF 10% 25V
2552	4822 124 41751	47μF 20% 50V
2553	4822 126 13486	15pF 2% 63V
2560	4822 124 41407	0,47μF 20% 63V
2561	4822 124 41407	0,47μF 20% 63V
2562	4822 124 41407	0,47μF 20% 63V
2563	4822 126 13581	0.22μF 20% 50V
2564	4822 126 13581	0.22μF 20% 50V
2565	4822 126 10525	8,2nF 10% 63V
2566	4822 126 10525	8,2nF 10% 63V
2571	4822 121 51252	470nF 5% 63V
2572	4822 121 51252	470nF 5% 63V
2573	4822 121 51252	470nF 5% 63V
2574	4822 121 51252	470nF 5% 63V
2575	4822 121 51252	470nF 5% 63V
2576	4822 121 51252	470nF 5% 63V
2577	5322 122 31866	6,8nF 10% 63V
2578	5322 122 31866	6,8nF 10% 63V
2579	5322 122 34123	1nF 10% 50V
2580	5322 122 34123	1nF 10% 50V
2581	4822 122 33175	2,2nF 20% 50V
2582	4822 124 81029	100μF 20% 25V
2583	4822 124 81029	100μF 20% 25V
2584	4822 122 33809	22nF 20% 50V
2591	4822 124 22263	220μF 20% 25V
2592	4822 124 22263	220μF 20% 25V
2593	4822 124 40433	47μF 20% 25V
2594	4822 124 40433	47μF 20% 25V
2595	5322 122 34099	470pF 10% 63V
2596	5322 122 34099	470pF 10% 63V
2597	4822 122 33575	220pF 5% 50V
2598	4822 122 33575	220pF 5% 50V
2599	4822 124 41751	47μF 20% 50V
2601	4822 126 12105	33nF 5% 63V
2602	4822 126 12105	33nF 5% 63V
2603	4822 122 33891	3,3nF 10% 63V
2604	4822 122 33891	3,3nF 10% 63V
2605	5322 122 34099	470pF 10% 63V
2606	5322 122 34099	470pF 10% 63V
2607	4822 126 13196	100nF 10% 25V
2608	4822 126 13196	100nF 10% 25V
2609	4822 121 51252	470nF 5% 63V
2610	4822 121 51252	470nF 5% 63V
2611	4822 126 10847	1,8nF 10% 63V
2612	4822 126 10847	1,8nF 10% 63V
2613	5322 122 34123	1nF 10% 50V
2614	5322 122 34123	1nF 10% 50V
2615	4822 122 33575	220pF 5% 50V
2616	4822 122 33575	220pF 5% 50V
2617	5322 122 34099	470pF 10% 63V
2618	5322 122 34099	470pF 10% 63V
2619	4822 124 41576	2,2μF 20% 50V
2620	4822 124 41576	2,2μF 20% 50V
2621	4822 124 81029	100μF 20% 25V
2623	4822 126 13482	470nF +80/-20% 16V
2624	4822 126 13482	470nF +80/-20% 16V
2631	4822 124 40242	1μF 20% 63V
2632	4822 124 40242	1μF 20% 63V
2633	5322 122 34099	470pF 10% 63V
2634	5322 122 34099	470pF 10% 63V
2637	4822 126 13692	47pF 1% 63V
2638	4822 126 13692	47pF 1% 63V
2639	4822 122 33809	22nF 20% 50V
2640	4822 124 40433	47μF 20% 25V
2641	4822 124 81029	100μF 20% 25V
2647	4822 124 81151	22μF 50V
2648	4822 124 81151	22μF 50V
2649	5322 122 32531	100pF 5% 50V
2650	5322 122 32531	100pF 5% 50V
2655	4822 124 40246	4,7μF 20% 63V
2656	5322 122 32531	100pF 5% 50V
2657	4822 126 13836	1μF 16V
2658	4822 122 33575	220pF 5% 50V
2661	4822 124 40242	1μF 20% 63V
2662	5322 122 34123	1nF 10% 50V
2663	5322 122 32448	10pF 5% 50V
2664	4822 124 40242	1μF 20% 63V
2666	4822 124 81029	100μF 20% 25V
2668	5322 122 34099	470pF 10% 63V
2669	4822 126 10002	100nF 20% 25V
2681	4822 126 13196	100nF 10% 25V
2682	4822 122 33808	10nF 20% 50V
2683	5322 122 34123	1nF 10% 50V
2685	4822 126 10002	100nF 20% 25V
2686	4822 122 33808	10nF 20% 50V
2687	4822 122 33797	47nF 20% 50V
2688	4822 122 33805	330pF 10% 63V
2689	4822 122 33805	330pF 10% 63V
2691	4822 122 33809	22nF 20% 50V
2692	4822 122 33809	22nF 20% 50V
2694	4822 126 10002	100nF 20% 25V
2711	5322 121 42386	100nF 5% 63V
2712	5322 121 42386	100nF 5% 63V
2713	5322 121 42386	100nF 5% 63V
2714	5322 121 42386	100nF 5% 63V
2715	5322 126 10184	680P 5% 50V.
2716	5322 126 10184	680P 5% 50V.
2717	4822 124 41579	10μF 20% 50V
2718	4822 124 41579	10μF 20% 50V
2719	4822 126 13196	100nF 10% 25V
2720	4822 122 33809	22nF20% 50V
2721	4822 122 33809	22nF20% 50V
2722	4822 126 13196	100nF 10% 25V
2723	4822 126 13196	100nF 10% 25V
2724	4822 126 13751	47nF 10% 63V
2725	4822 126 13751	47nF 10% 63V
2726	4822 126 13196	100nF 10% 25V
2727	4822 121 42408	220nF 5% 63V
2728	4822 121 42408	220nF 5% 63V
2729	4822 124 40246	4,7μF 20% 63V
2730	4822 124 40246	4,7μF 20% 63V
2731	4822 121 42408	220nF 5% 63V
2732	4822 121 42408	220nF 5% 63V
2733	4822 126 13751	47nF 10% 63V
2734	5322 126 10223	4,7nF 10% 63V
2735	5322 121 42498	680nF 5% 63V
2737	5322 126 10794	220pF 5% 63V
2738	4822 126 13196	100nF 10% 25V
2739	4822 126 13196	100nF 10% 25V
2740	4822 126 10847	1,8nF 10% 63V
2741	4822 122 33808	10nF 20% 50V
2742	4822 121 51399	47nF 10% 50V
2743	5322 121 42386	100nF 5% 63V
2744	5322 121 42386	100nF 5% 63V
2745	4822 121 51399	47nF 10% 50V
2746	4822 126 10847	1,8nF 10% 63V
2747	4822 122 33808	10nF 20% 50V
2748	4822 124 40242	1μF 20% 63V
2749	4822 124 41584	100μF 20% 10V
2750	4822 124 81151	22μF 50V
2751	4822 124 41579	10μF 20% 50V
2752	4822 124 41579	10μF 20% 50V
2753	4822 126 13061	220nF 20% 25V
2754	4822 126 13691	27pF 1% 63V
2755	4822 126 13691	27pF 1% 63V
2756	4822 124 81151	22μF 50V
2757	4822 124 81151	22μF 50V
2758	4822 124 41584	100μF 20% 10V
2759	4822 126 13196	100nF 10% 25V
2760	4822 126 10002	100nF 20% 25V
2761	4822 122 33175	2,2nF 20% 50V
2762	4822 124 41584	100μF 20% 10V
2763	5322 126 10223	4,7nF 10% 63V
2764	4822 126 13473	220nF +80/-20% 50V
2765	4822 124 81029	100μF 20% 25V
2766	4822 124 40196	220μF 20% 16V
2767	4822 124 41579	10μF 20% 50V
2768	5322 126 10223	4,7nF 10% 63V
2769	4822 124 41579	10μF 20% 50V
2770	4822 124 40433	47μF 20% 25V
2771	4822 124 41751	47μF 20% 50V
2772	4822 124 41751	47μF 20% 50V
2773	4822 124 40246	4,7μF 20% 63V

ELECTRICAL PARTS LIST - AF6 BOARD

CAPACITORS

2774	4822 124 40246	4,7µF 20% 63V
2775	5322 122 34099	470pF 10% 63V
2776	5322 122 34099	470pF 10% 63V
2777	5322 126 10794	220pF 5% 63V
2778	5322 126 10794	220pF 5% 63V
2779	4822 124 40246	4,7µF 20% 63V
2780	4822 124 40246	4,7µF 20% 63V
2781	4822 126 13196	100nF 10% 25V
2785	5322 122 34123	1nF 10% 50V
2786	5322 122 34123	1nF 10% 50V
2787	5322 122 32531	100pF 5% 50V
2788	5322 122 32531	100pF 5% 50V
2789	5322 122 32531	100pF 5% 50V
2790	5322 122 32531	100pF 5% 50V

RESISTORS

3501	4822 051 10102	1k 2% 0,25W
3502	4822 117 10833	10k 1% 0,1W
3511	4822 051 20182	1k8 5% 0,1W
3512	4822 051 20182	1k8 5% 0,1W
3513	4822 116 83961	6k8 5%
3514	4822 117 11507	6k8 1% 0,1W
3515	4822 117 11507	6k8 1% 0,1W
3516	4822 117 11507	6k8 1% 0,1W
3517	4822 051 20332	3k3 5% 0,1W
3518	4822 051 20332	3k3 5% 0,1W
3519	4822 051 20333	33k 5% 0,1W
3520	4822 051 20333	33k 5% 0,1W
3521	4822 116 52234	100k 5% 0,5W
3522	4822 116 52234	100k 5% 0,5W
3523	4822 117 11149	82k 1% 0,1W
3524	4822 117 11149	82k 1% 0,1W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 10102	1k 2% 0,25W
3527	4822 051 10102	1k 2% 0,25W
3528	4822 051 10102	1k 2% 0,25W
3529	4822 117 11449	2k2 1% 0,1W
3530	4822 116 52256	2k2 5% 0,5W
3531	4822 116 52256	2k2 5% 0,5W
3532	4822 116 52256	2k2 5% 0,5W
3533	4822 116 52234	100k 5% 0,5W
3534	4822 116 52234	100k 5% 0,5W
3535	4822 051 20104	100k 5% 0,1W
3536	4822 051 20104	100k 5% 0,1W
3537	4822 051 20333	33k 5% 0,1W
3538	4822 051 20333	33k 5% 0,1W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 10102	1k 2% 0,25W
3542	4822 051 10102	1k 2% 0,25W
3545	4822 051 20273	27k 5% 0,1W
3546	4822 116 52264	27k 5% 0,5W
3547	4822 051 20182	1k8 5% 0,1W
3548	4822 051 20182	1k8 5% 0,1W
3549	4822 051 20562	5k6 5% 0,1W
3550	4822 117 10834	47k 1% 0,1W
3551	4822 051 20154	150k 5% 0,1W
3552	4822 051 20154	150k 5% 0,1W
3553	4822 051 20334	330k 5% 0,1W
3554	4822 117 10353	150R 1% 0,1W
3555	4822 051 20391	390R 5% 0,1W
3556	4822 117 11449	2k2 1% 0,1W
3557	4822 117 11149	82k 1% 0,1W
3558	4822 051 20225	2M2 5% 0,1W
3559	4822 051 20225	2M2 5% 0,1W
3560	4822 051 20475	4M7 5% 0,1W
3561	4822 116 52283	4k7 5% 0,5W
3562	4822 116 52283	4k7 5% 0,5W
3563	4822 117 11449	2k2 1% 0,1W
3564	4822 117 11449	2k2 1% 0,1W
3565	4822 117 11449	2k2 1% 0,1W
3566	4822 117 11449	2k2 1% 0,1W
3567	4822 051 20223	22k 5% 0,1W
3568	4822 051 20223	22k 5% 0,1W
3569	4822 051 20472	4k7 5% 0,1W
3570	4822 051 20472	4k7 5% 0,1W
3571	4822 051 20472	4k7 5% 0,1W
3572	4822 051 20472	4k7 5% 0,1W
3573	4822 051 20472	4k7 5% 0,1W
3574	4822 051 20472	4k7 5% 0,1W
3575	4822 117 11503	220R 1% 0,1W
3576	4822 117 11503	220R 1% 0,1W
3577	4822 050 11002	1k 1% 0,4W
3578	4822 050 11002	1k 1% 0,4W
3580	4822 051 10102	1k 2% 0,25W
3581	4822 117 11449	2k2 1% 0,1W
3582	4822 116 52256	2k2 5% 0,5W
3583	4822 117 11503	220R 1% 0,1W
3584	4822 117 11503	220R 1% 0,1W
3585	4822 117 10834	47k 1% 0,1W
3586	4822 117 10834	47k 1% 0,1W
3587	4822 051 20154	150k 5% 0,1W
3588	4822 051 20154	150k 5% 0,1W
3589	4822 117 11449	2k2 1% 0,1W
3590	4822 117 11449	2k2 1% 0,1W
3591	4822 051 20223	22k 5% 0,1W
3592	4822 051 20223	22k 5% 0,1W
3593	4822 116 83884	47k 5% 0,5W
3594	4822 117 10834	47k 1% 0,1W
3595	4822 051 20333	33k 5% 0,1W
3596	4822 117 10834	47k 1% 0,1W
3597	4822 051 20105	1M 5% 0,1W
3598	4822 051 20475	4M7 5% 0,1W
3599	4822 117 11148	56k 1% 0,1W
3600	4822 117 11148	56k 1% 0,1W

3601	4822 051 20332		3k3 5% 0,1W
3602	4822 051 20332		3k3 5% 0,1W
3603	4822 051 20684		680k 5% 0,1W
3604	4822 051 20684		680k 5% 0,1W
3605	4822 117 13579		220k 1% 0,1W
3606	4822 117 13579		220k 1% 0,1W
3607	4822 116 83864		10k 5% 0,5W
3608	4822 116 83864		10k 5% 0,5W
3609	4822 117 10833		10k 1% 0,1W
3610	4822 117 10833		10k 1% 0,1W
3611	4822 051 20562		5k6 5% 0,1W
3612	4822 051 20562		5k6 5% 0,1W
3613	4822 051 20562		5k6 5% 0,1W
3614	4822 051 20562		5k6 5% 0,1W
3615	4822 051 20562		5k6 5% 0,1W
3616	4822 051 20562		5k6 5% 0,1W
3617	4822 051 20822		8k2 5% 0,1W
3618	4822 051 20822		8k2 5% 0,1W
3619	4822 051 20822		8k2 5% 0,1W
3620	4822 051 20822		8k2 5% 0,1W
3621	4822 051 20822		8k2 5% 0,1W
3622	4822 051 20822		8k2 5% 0,1W
3623	4822 117 10834		47k 1% 0,1W
3624	4822 117 10834		47k 1% 0,1W
3625	4822 051 10102		1k 2% 0,25W
3626	4822 051 10102		1k 2% 0,25W
3627	4822 117 11503		220R 1% 0,1W
3628	4822 117 11503		220R 1% 0,1W
3629	4822 117 11454		820R 1% 0,1W
3631	4822 116 52231		820R 5% 0,5W
3632	4822 116 52231		820R 5% 0,5W
3633	4822 051 20562		5k6 5% 0,1W
3634	4822 051 20562		5k6 5% 0,1W
3635	4822 117 10833		10k 1% 0,1W
3636	4822 117 10833		10k 1% 0,1W
3637	4822 117 10833		10k 1% 0,1W /37
3637	4822 117 10834		47k 1% 0,1W /22
3638	4822 117 10833		10k 1% 0,1W /37
3638	4822 117 10834		47k 1% 0,1W /22
3639	4822 051 20223		22k 5% 0,1W /37
3639	4822 117 11383		12k 1% 0,1W /22
3640	4822 051 20223		22k 5% 0,1W /37
3640	4822 117 11383		12k 1% 0,1W /22
3641	4822 052 10109	⚠	10R 5% 0,33W
3642	4822 051 20472		4k7 5% 0,1W
3643	4822 051 20472		4k7 5% 0,1W
3645	4822 051 20479		47R 5% 0,1W
3646	4822 051 20479		47R 5% 0,1W
3647	4822 051 20479		47R 5% 0,1W
3648	4822 051 20479		47R 5% 0,1W
3649	4822 051 20331		330R 5% 0,1W
3650	4822 051 20331		330R 5% 0,1W
3651	4822 051 20392		3k9 5% 0,1W
3652	4822 051 20392		3k9 5% 0,1W
3655	4822 116 83864		10k 5% 0,5W
3656	4822 117 10833		10k 1% 0,1W
3657	4822 051 10102		1k 2% 0,25W
3658	4822 051 20562		5k6 5% 0,1W
3660	4822 051 20472		4k7 5% 0,1W
3661	4822 051 20475		4M7 5% 0,1W
3662	4822 051 10102		1k 2% 0,25W
3663	4822 051 10102		1k 2% 0,25W
3665	4822 051 20153		15k 5% 0,1W
3666	4822 051 20562		5k6 5% 0,1W
3671	4822 117 13579		220k 1% 0,1W
3672	4822 117 13579		220k 1% 0,1W
3673	4822 117 12955		2k7 1% 0,1W
3674	4822 051 20334		330k 5% 0,1W
3675	4822 117 11449		2k2 1% 0,1W
3676	4822 051 20229		22R 5% 0,1W
3677	4822 051 20471		470R 5% 0,1W
3681	4822 052 10229	⚠	22R 5% 0,33W
3682	4822 051 10102		1k 2% 0,25W
3683	4822 051 20471		470R 5% 0,1W
3684	4822 051 20392		3k9 5% 0,1W
3691	4822 117 11449		2k2 1% 0,1W
3692	4822 117 10833		10k 1% 0,1W
3693	4822 051 20562		5k6 5% 0,1W
3694	4822 051 20562		5k6 5% 0,1W
3695	4822 051 20228		2R2 5% 0,1W
3699	4822 050 11002		1k 1% 0,4W
3711	4822 117 10833		10k 1% 0,1W
3712	4822 117 10833		10k 1% 0,1W
3713	4822 051 20273		27k 5% 0,1W
3714	4822 051 20273		27k 5% 0,1W
3715	4822 051 20104		100k 5% 0,1W
3716	4822 051 20104		100k 5% 0,1W
3717	4822 051 20153		15k 5% 0,1W
3718	4822 051 20153		15k 5% 0,1W
3719	4822 117 10834		47k 1% 0,1W
3720	4822 117 10834		47k 1% 0,1W
3721	4822 117 11507		6k8 1% 0,1W
3722	4822 117 11507		6k8 1% 0,1W
3723	4822 051 20225		2M2 5% 0,1W
3724	4822 051 20104		100k 5% 0,1W
3725	4822 117 13579		220k 1% 0,1W
3726	4822 051 20334		330k 5% 0,1W
3727	4822 051 20223		22k 5% 0,1W
3728	4822 117 11449		2k2 1% 0,1W
3729	4822 117 10834		47k 1% 0,1W
3732	4822 117 10833		10k 1% 0,1W
3733	4822 117 10833		10k 1% 0,1W
3734	4822 051 10102		1k 2% 0,25W
3735	4822 051 10102		1k 2% 0,25W

RESISTORS

3736	4822 117 10834	47k 1% 0,1W
3737	4822 051 20229	22R 5% 0,1W
3738	4822 117 12955	2k7 1% 0,1W
3739	4822 050 11002	1k 1% 0,4W
3740	4822 050 11002	1k 1% 0,4W
3741	4822 051 10102	1k 2% 0,25W
3742	4822 051 10102	1k 2% 0,25W
3743	4822 051 20105	1M 5% 0,1W
3745	4822 116 83874	220k 5% 0,5W
3746	4822 050 11002	1k 1% 0,4W
3748	4822 117 13579	220k 1% 0,1W
3749	4822 051 10102	1k 2% 0,25W
3751	4822 051 20101	100R 5% 0,1W
3752	4822 116 52283	4k7 5% 0,5W
3753	4822 051 20472	4k7 5% 0,1W
3755	4822 117 10833	10k 1% 0,1W
3756	4822 117 10833	10k 1% 0,1W
3757	4822 051 20104	100k 5% 0,1W
3758	4822 051 20104	100k 5% 0,1W
3759	4822 051 20273	27k 5% 0,1W
3760	4822 051 20273	27k 5% 0,1W
3761	4822 117 10833	10k 1% 0,1W
3762	4822 117 10833	10k 1% 0,1W
3765	4822 051 10102	1k 2% 0,25W
3767	4822 050 11002	1k 1% 0,4W
3768	4822 050 11002	1k 1% 0,4W
3769	4822 050 11002	1k 1% 0,4W
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805
4548	4822 051 20008	0R Jumper 0805
4549	4822 051 20008	0R Jumper 0805
4551	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 20008	0R Jumper 0805
4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4566	4822 051 20008	0R Jumper 0805
4567	4822 051 20008	0R Jumper 0805
4568	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4664	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5511	4822 157 62552	Coil 2,2µH 5%
5523	4822 157 62552	Coil 2,2µH 5%
5531	4822 157 62552	Coil 2,2µH 5%
5532	4822 157 62552	Coil 2,2µH 5%
5711	4822 242 72527	Ceramic Resonator
5712	4822 157 62552	Coil 2,2µH 5%

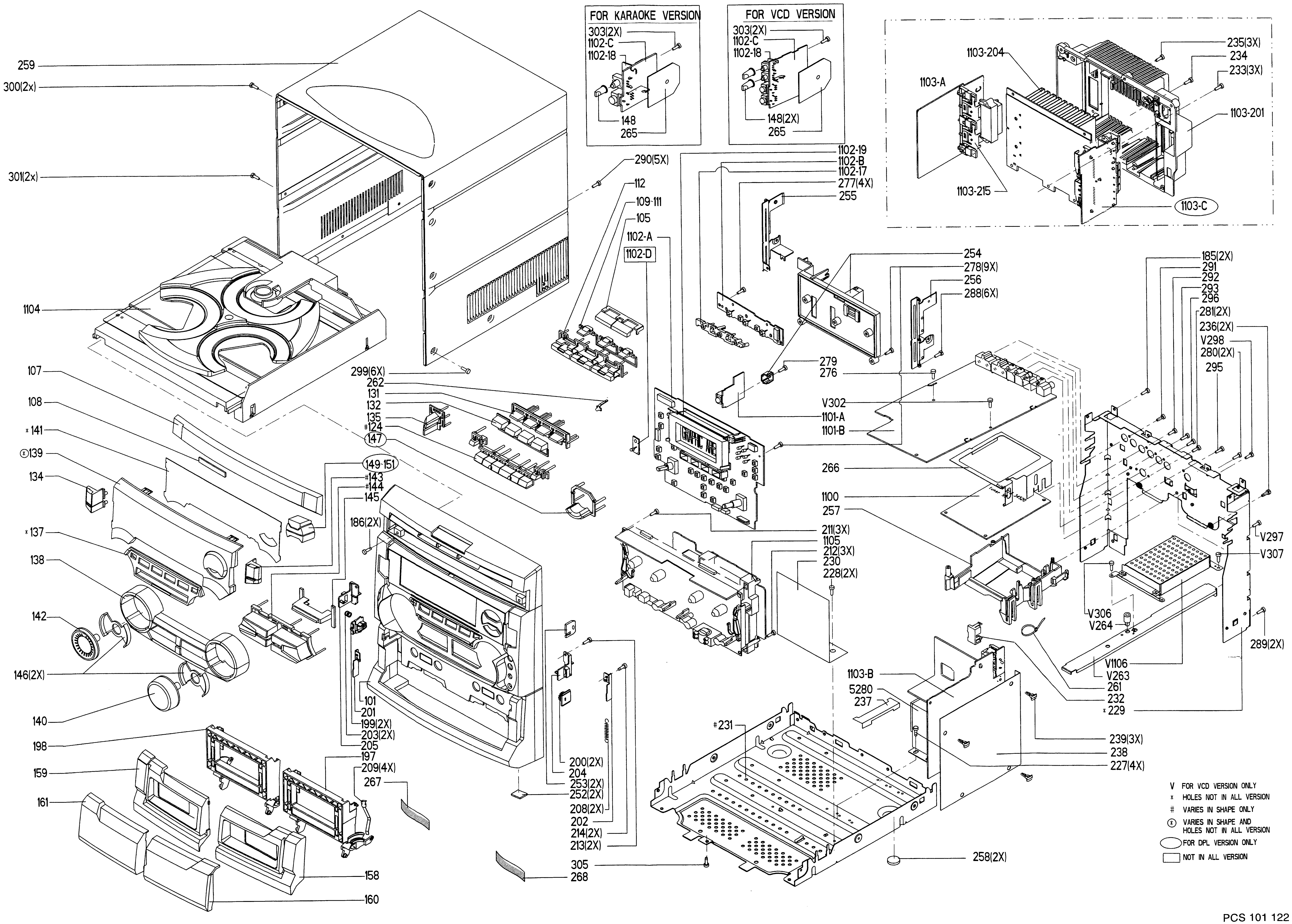
DIODES

6511	4822 130 30862	BZX55-F9V1
6512	4822 130 30862	BZX55-F9V1
6513	4822 130 31878	1N4003G
6515	4822 130 30621	1N4148
6516	4822 130 30621	1N4148
6517	4822 130 30621	1N4148
6531	4822 130 30621	1N4148
6711	4822 130 34173	BZX79-C5V6

TRANSISTORS & INTEGRATED CIRCUITS

7511	4822 209 33652	TEA6321T/V1
7512	4822 209 83357	NJM4560M
7513	4822 209 83357	NJM4560M
7515	4822 209 31378	NJM4556MB
7521	4822 130 60511	BC847B
7522	4822 130 60511	BC847B
7523	4822 130 60511	BC847B
7524	4822 130 60511	BC847B
7525	4822 130 60511	BC847B
7526	5322 130 60508	BC857B
7527	4822 130 60511	BC847B
7528	4822 130 60511	BC847B
7529	5322 130 60508	BC857B
7531	4822 130 60511	BC847B
7532	4822 130 60511	BC847B
7533	4822 130 60511	BC847B
7534	4822 130 60511	BC847B
7535	4822 130 42804	BC817-25
7536	4822 130 42804	BC817-25
7537	4822 130 60511	BC847B
7538	4822 130 60511	BC847B
7539	5322 130 60508	BC857B
7541	4822 130 60511	BC847B
7543	4822 130 42804	BC817-25
7551	4822 209 17345	M62320FP
7552	4822 130 41246	BC327-25
7553	4822 130 60511	BC847B
7711	4822 209 17347	M62460FP
7712	4822 209 17349	M62429FP
7713	4822 130 60511	BC847B
7714	4822 130 60511	BC847B
7715	4822 130 60511	BC847B
7716	4822 130 60511	BC847B
7717	4822 209 31378	NJM4556MB

Note : Only the parts mentioned in this list are normal service spare parts.


259
300(2x)
301(2x)
1104
107
108
*141
139
134
*137
138
142
146(2X)
140
198
159
161
FOR KARAOKE VERSION
303(2X)
1102-C
1102-18
148
265
FOR VCD VERSION
303(2X)
1102-C
1102-18
148(2X)
265
290(5X)
112
109-111
105
1102-A
1102-D
299(6X)
262
131
132
135
#124
147
149-151
#143
#144
145
186(2X)
101
201
199(2X)
203(2X)
205
197
209(4X)
267
158
160
200(2X)
204
253(2X)
252(2X)
208(2X)
202
214(2X)
213(2X)
305
268
1102-19
1102-B
1102-17
277(4X)
255
254
278(9X)
256
288(6X)
279
276
V302
1101-A
1101-B
266
1100
257
211(3X)
1105
212(3X)
230
228(2X)
#231
1103-B
5280
237
258(2X)
1103-204
1103-A
1103-215
1103-C
235(3X)
234
233(3X)
1103-201
185(2X)
291
292
293
296
281(2X)
236(2X)
V298
280(2X)
295
V297
V307
V306
V264
289(2X)
V1106
V263
261
232
*229
239(3X)
238
227(4X)

V FOR VCD VERSION ONLY
* HOLES NOT IN ALL VERSION
# VARIES IN SHAPE ONLY
(*) VARIES IN SHAPE AND HOLES NOT IN ALL VERSION
○ FOR DPL VERSION ONLY
☐ NOT IN ALL VERSION

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

101	4822 459 05252	Cabinet Front /37
101	4822 459 05259	Cabinet Front /22
105	4822 410 12286	Button Set CDC Open/Close
107	4822 442 01757	Cover CDC /37
107	4822 442 01776	Cover CDC /22
108	4822 454 13443	Badge Philips/Magnavox /37
108	4822 454 13445	Badge Philips /22
112	4822 410 12287	Button Set CDC Sel
124	4822 410 12288	Button Set Control
131	4822 464 10514	Frame Lightguide Source Sel
132	4822 410 12289	Button Set Source
134	4822 410 12291	Button Standby/Timer
135	4822 410 12292	Button Set Dub/Rec
137	4822 442 01758	Cover Control
138	4822 442 01759	Cover Orn SNP
139	4822 450 10617	Window Display /37
139	4822 450 10625	Window Display /22
140	4822 410 12303	Knob Volume
142	4822 273 10368	Jog Rotary
143	4822 442 01761	Cover RDS/NEWS /37
143	4822 410 12316	Button Set RDS/NEWS /22
144	4822 410 12293	Button Set SNP /37
144	4822 410 12317	Button Set SNP /22
147	4822 410 12294	Button DPL
148	4822 410 12318	Knob Karaoke /22
158	4822 443 11159	Cover Cassette Right
159	4822 443 11161	Cover Cassette Left
160	4822 381 12075	Lens Cassette Right
161	4822 381 12074	Lens Cassette Left
197	4822 443 10488	Door Cassette Right
198	4822 443 10487	Door Cassette Left
199	4822 402 10621	Push-Catch
200	4822 529 10322	Damper Assembly
203	4822 492 11344	Spring Compression
204	4822 402 11246	Bracket Right
205	4822 402 11245	Bracket Left
208	4822 492 11345	Spring Tension
209	4822 492 42787	Spring Cassette
232	4822 402 10288	Bracket Mains Socket
239	4822 466 93148	Spacer 5mm
252	4822 462 40683	Foot Rubber (SQ)
254	4822 466 12197	Plate Front
258	4822 462 40683	Plate (Foot)
259	4822 426 10807	Cabinet Rear
350	4822 445 10815	LS Pair To Single /37
350	4822 445 10823	LS Pair To Single /22
351	4822 320 11094	FM Aerial /37
351	4822 303 50063	FM Aerial /22
352	4822 240 10358	Center Speaker /37
352	4822 240 10359	Surround Speaker /37
352	4822 445 10824	Center Speaker /22
352	4822 445 10825	Surround Speaker /22
353	4822 445 10816	Active Subwoofer /37
356	4822 219 10678	Remote Control /37
356	4822 219 10685	Remote Control /22
384	4822 303 50082	AM Frame Aerial
385	4822 321 11466 ⚠	Mains Cord /37
385	4822 321 10249 ⚠	Mains Cord /22
387	4822 736 16732	Instruction For Use /37
387	4822 736 16746	Instruction For Use /22
1571	4822 320 12653	Flex Cable BD 6P 150mm
1573	4822 320 12654	Flex Cable AD 7P 220mm
1653	4822 320 12655	Flex Cable BD 7P 120mm
1680	4822 320 12656	Flex Cable AD 9P 280mm Folded
1681	4822 320 12651	Flex Cable BD 23P 560mm
5280	4822 146 10746 ⚠	Mains Transformer /37
5280	4822 146 10728 ⚠	Mains Transformer /22

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

4822 240 10364	Woofer 5,25" 6R 50W
4822 464 10519	Cloth Frame Assembly
4822 454 13456	Badge Philips/Magnavox /37
4822 454 13457	Badge Philips /22
4822 240 10365	Tweeter 2,5" 6R 10W

SURROUND BOX BREAKDOWN

4822 240 10372	Speaker 4" 3R 13W

Note : Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

185	D3 x 10
186	D3 x 10
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
227	M3 x 6
228	M3 x 6
233	M3 x 10
234	D3 x 12
235	M3 x 10
236	M3 x 10
276	D3 x 12
277	D3 x 12
278	D3 x 12
279	M3 x 12
280	D3 x 12
281	D3 x 12
288	D3 x 12
289	M3 x 10
290	M3 x 10
291	D3 x 12
292	D3 x 12
293	D3 x 12
295	D3 x 12
296	D3 x 12
299	M3 x 10
300	M3 x 10
301	M3 x 10
303	D3 x 12
305	M3 x 6